

**FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES**

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UNSTAMPED . . . FIVEPENCE.

THOMAS AND MARLBOROUGH, MINING AGENTS.

Mr. T. P. THOMAS begs to return his sincere thanks to his friends for the kind

support which he has received for the last 14 years, and to inform them that he has TAKEN INTO CO-PARTNERSHIP with him his clerk, Mr. WM. MARLBOROUGH, who has been with him nearly the whole of the above term, and whose diligence and business-like habits will, he trusts, be a guarantee for all transactions entrusted to him being as efficiently conducted as heretofore.

**EAST WHEAL VOR TIN AND COPPER MINE. TREVARNON, HELSTON, CORNWALL. WITH THE ENGINE AND OTHER MACHINERY, BUILDINGS, AND APPARATUS, MATERIALS, ORES, STORES, &c.**

**MR. T. THOMAS** has been directed with instructions to SELL, BY PUBLIC AUCTION, (without reserve), at Garfield's Coffee House, Cannon-street, Cornhill, London, on Thursday the 9th and on Friday the 10th

duced, the above valuable MINE, MACHINERY, MATERIALS, ORES, STORES, BUILDINGS, and PLANT, forming the whole of the property of the shareholders in and on the mine, comprising, amongst other things, a 40 in. cylinder PUMPING ENGINE, with 9 tons boiler, nearly new, with the pumps, pitwork, dressing apparatus, ores, materials, stores, &c., the mine being in a full state of working, and making returns. The sett is extensive, the royalty moderate (1-18th), the lease for 21 years, and the materials are all in first-rate condition, and nearly new. The sett adjoins the celebrated Great Wheel For Mine, and, with a little further capital to be expended in laying open ore ground, the returns may be increased sufficient to make a profitable and dividend paying mine.

For further particulars, and to view the mine, application may be made to Mr. D. G. GOATLEY, 31, Threadneedle-street, London; to Capt. THOS. UARNS, on the mine; and to Mr. F. P. THOMAS, the auctioneer, 2, Crown-court, Threadneedle-street, London.

**PRELIMINARY NOTICE.**

**MACHINERY AND MATERIALS FOR SALE, BY AUCTION,**  
early in March, unless previously disposed of:—An excellent 22 in. cylinder

**ROTARY PUMPING ENGINE**, with fly-wheel and sweep rod attached; boiler weighing 10 tons; powerful crusher; drawing apparatus; about 45 fms. 6 in. pumps, including one plunger-lift; flat and shaft rolls; two cast-iron bobs, &c.; two horse-whims; pulley stands and pulleys; flat and other ropes and chains; smiths and carpenter's tools; account-house furniture, &c.; also, small stock of materials. The boiler, crusher, and pitwork, nearly new.

For permission to view, apply to Capt. EDWD. ROGERS, Rorrington Mines, Chirbury, near Shrewsbury; or to Mr. THOMAS WATSON, 57, Threadneedle-street.

**JOHN B. PIKE** has FOR SALE the undermentioned **SHARES**:—

9) 23s Bryniali, £3½.	50 Castell, 11s. 6d.	150 West Grenville, 8s.
2 Ding Dong.	10 Duke of Cornwall, £5.	10 West Grenville, 8s.
10 East Margaret, £11.	1 East Tolgus, £20.	10 Porekell Unit, £2½.
5 Gonaemena, £18s.	2 Gramb and St. Aubyn.	15 Sithney Buller, £2.
10 Gl. Sou. Tolgus, £15½.	15 East Alfred.	10 South Carn Brea.
10 Herod-foot.	30 Great Howas, 11½.	4 West Francis, £29.
12 Hingham Down, £14½.	10 Great Alfred.	20 Wheel Edward.

50 Nanteco and Penrhui,	25 Great Busy, £55.	50 Great Glyn.
1 South France, £350.	50 Lady Bertha, £50.	50 Grenville, £15.
1 Buller, £315.	5 Leland Combs, £50.	50 Harriett.
20 Buller & Basset United,	10 North Buller.	1 Margery.
£215.	4 North France.	50 Zion.
1 Cargill, £25.	50 Pedin-andrea.	100 Nanteco and Penrhui.

Mr. J. R. Pike will be happy to advise capitalists about to invest in mines, either for investment or speculation.

A daily price list of business done in the Mining Exchange forwarded on receipt of stamped addressed envelope.—Friday, March 6, 1857.

**MR. WILLIAM MOORE, STOCK AND SHAREDEALER.**

**M** 11, HERCULES CHAMBERS, OLD BROAD STREET.  
N.B. Business transacted in every description of stock and shares.

**SECURE INVESTMENTS.**—**MR. REGINALD HORLEY,**  
No. 48, THREADNEEDLE STREET, ENGLISH AND FOREIGN STOCK,  
SHARE, AND MINING BROKER. I supply ADVISE AND PRESENT  
all those who may favour him with their business, or the most MODERATE INVEST-  
ING THEIR CAPITAL in permanently dividend-paying securities, and will endeavour  
to caution them against embarking in those fraudulent schemes which involve such  
disastrous results as have attended the recent bank failures. Mining operations care-  
fully watched, and faithfully represented. Business transacted in the English funds,  
at 1-10th per cent. Country correspondents promptly communicated with. A weekly  
Official List of Prices sent gratis, if required.  
**R. HORLEY, Sworn Broker, 48, Threadneedle-street.**

**MR. R. LINTHORNE, ENGLISH AND FOREIGN MINING**  
**AGENT, 3, ADAM'S COURT, OLD BROAD STREET, LONDON.**  
BUSINESS TRANSACTED IN ALL ENGLISH AND FOREIGN MINES, and other

SECURITIES, on the usual terms of commission. Information afforded in respect to Dividend-paying and Progressive Mines.

**MR. W. H. BRUMBY, STOCK AND SHAREBROKER**  
 1, QUIET STREET, BATH, is in a position to give the BEST ADVICE in the SELECTION and PURCHASE of DIVIDEND and PROGRESSIVE MINES.

**M**R. F. LISABÉ, C.E., CONSULTING MINING ENGINEER.  
OFFICE, 2, DAME STREET, DUBLIN.  
Mr. LISABÉ, may be CONSULTED personally, or by letter. His long experience in Ireland will be found useful to capitalists desirous of investing money in mining and other speculations in that country.

**MATTHEW FRANCIS**, after a week, if this advertisement is not withdrawn, will be in a position to **NEGOTIATE for a FEW SHARES** in one of the most promising young mines in Cardiganshire.—Particulars to be had of **MATTHEW FRANCIS**, Steedfagerig, Rhayader, Radnorshire.—Feb. 20, 1857.

**M. R. WILLIAM MICHELL CONTINUES to DEAL in ALL** DIVIDEND and good **PROGRESSIVE MINES**, at exceedingly close prices. Cash given in exchange for transfers to all well-known parties; and parties of respectability can have shares registered previous to payment.

Money advanced on Mining Shares.

3, Austinfriars, Old Broad-street, London, March 6, 1857.

**CAPT. THOMAS DUNN, of TAVISTOCK, undertakes to INSPECT**

**NORTH AND SOUTH WALES.—CAPT. JAMES ROACH**  
(Manager of the Bryntal Mines, near Llanidloes, Montgomeryshire) OFFERS  
HIMSELF TO INSPECT AND REPORT UPON MINES AND MINERAL PROPERTY IN ENGLAND, IRELAND, SCOTLAND, OR WALES. No objection to take the management of any mine or mines in the neighbourhood of Tavistock.

**TO BE DISPOSED OF, a SETT,** adjoining one of the oldest and richest mines in CARDIGANSHIRE, and on the same lodes.—Apply to Mr. ROBERT JONES, miner, &c., Llanidloes, North Wales.

**STEAM-ENGINES.—TO BE LET ON HIRE, PORTABLE**  
**STEAM-ENGINES, ON WHEELS,** for any period, or FOR SALE, from 6 to 25-horse power, which have been successfully introduced and used by contractors, millers, manufacturers, &c., for many years. Several ready for immediate delivery.—Apply to JOHN HALL, jun., 6, Mining-lane, City, E.C.

**INVESTMENTS IN BRITISH MINES.—**  
The NEXT NUMBER of Mr. MURCHISON'S QUARTERLY REVIEW, with full particulars of the principal DIVIDEND and PROGRESSIVE MINES, will appear in the first week of April, and will include a MAR. of the L. PREL. CONGR.

**ROSEWARNE UNITED MINING DISTRICTS; price 1s.**  
Copies of the REVIEW for the QUARTER and the YEAR ending 31st of December 1856, with a Map of the Camborne District, can be obtained at Mr. Mucunson's offices, 117, Bishopsgate-street Within, London.

**MESSRS. A. J. HUTCHINGS AND CO.'S**  
**PATENT IMPROVED WIRE ROPE.**  
SOLE MAKERS TO THE  
LORDS OF THE ADMIRALTY, THE FRENCH AND TURKISH GOVERNMENTS  
And the principal Colliery Proprietors throughout the kingdom.  
**MANUFACTORY, MILL WALL, POPLAR, LONDON.**  
ROUND and FLAT ROPES of every description, suitable for mining operations or other purposes, GALVANISED or UNGALVANISED, MANUFACTURED upon the newest and most improved machinery, ensuring greater pliability, durability, and strength; and is admitted by the principal coal proprietors to be far superior to any other kind of wire rope. The superiority of these ropes over hempen ones, in point of strength, lightness, durability, and cost, is admitted by all who have tried them.  
**GUIDE ROPES, SIGNAL CORD, LIGHTNING CONDUCTORS, &c.**  
Offices, 117, Fenchurch-street, London.

**THE MIDLAND IRON COMPANY, ROTHERHAM, YORKSHIRE, MANUFACTURERS OF RAILWAY TYRES AND AXLES FOR LOCOMOTIVE ENGINES, CARRIAGE AND WAGON WHEELS.** From the test to which this iron has been submitted by engineers and railway companies during several years, its superior quality has been generally acknowledged, and can be unhesitatingly affirmed.







Mr. Mark Hunter, Chairman of the Commercial Bank of London, or by any other person of equal responsibility and standing, on bond being respectively given to the award.

Again, in respect to the Emily Mine, Mr. Sheppard intimates that I wish to evade the laws of my own country, and to appeal solely to those of Brazil. This is another motive for having an arbitration conducted in Brazil, that the evidence would be easily obtained on the spot; but, if written documents from thence received as legal evidence, I am willing that my claims, even as regards the Emily, should be arbitrated by the same party, and in the same manner as above stated.

The assertion made by Mr. Sheppard, that he has supplied the necessary funds for opening up the property in Brazil, has not the smallest foundation; in fact, Mr. Sheppard is not even known or recognised in Minas Gerais in any shape whatever. The wisest counsel prevailed, how different would have been the position and prospects of the shareholders! View some of the results of these ill-advised Chancery proceedings: Mines stopped; credit destroyed; estates endangered; debts accumulated; there is no remedy for this state of things! Is Mr. Sheppard really the representative of even a majority of the shareholders? If not, let a committee be appointed; let a gentleman be selected to treat with me, unassisted by the pressure of the inflated heavy Chancery bill of costs. I am not difficult to treat with, for Mr. Charles Hill, of the Stock Exchange, chairman of the last committee, wrote to me, in which I had met his advances for a settlement. I have collected, at much cost and expense, a mass of most valuable and important information, bearing on the properties, which I am ready to impart to any gentleman who may be authorised to treat with me, and I believe the result would be most beneficial to all concerned; but I most solemnly declare, that if the present persecution be persisted in, supported by the deluded shareholders, I will at once abandon the Coacoe Mines to the Brazilian proprietors, and dispose of the remainder of the properties in the most advantageous manner possible.

EDWARD OXFORD.

No. 3, Rue du Dauphin, Paris, March 3.

### TESTIMONIALS.

Sir,—Mr. Marriott, in presenting to Capt. C. Thomas, at Dolcoath Mine, the testimonial, truly said, that the present is the "testimonial age," for at no previous age were such gifts so common. All sorts of persons, except the labourer, have been the recipients of some kind of testimonial. A minister of the Gospel, on leaving a parish, is presented with a testimonial; a schoolmaster, on relinquishing his arduous duties; a mine speculator, for instance, for setting mines to work, and another (Mr. W. Williams) for opening a mine at a tortoise pace, for lessening drunkenness; and now a mine agent, for getting a mine into a dividend state; and another (Capt. W. Richards), for having got Wheal Bassett into the same state. I have nothing to say against any of the gentlemen who have received the presents, but this I say, if Capt. C. Thomas is fairly entitled to a present for having got Dolcoath to give dividends, after so many years of poverty, is it not fair that other managers who have done much better for their employers should be rewarded too? Capt. Thomas is a good agent, but not a better than a dozen that must be named, who have been more successful in mining. I have heard that Capt. Thomas has not another paying mine under his management; whereas I know an agent who had seven or eight dividend mines at one time, and he had no testimonial. I look upon the testimonial to Capt. Thomas as a present from Mr. Marriott—a thank-offering for furnishing large dues to Mr. Bassett, the lord. If the principle is to be affirmed that the managing agent of every dividend mine is to receive from the lord and adventurers a tangible mark of their favour, the following agents should forthwith receive a similar distinction:—

Mr. Joseph Lloyd, for Capt. Bassett, North Bassett, West Bassett, &c.  
 Mr. J. H. Hitchens, for Dorton Great Consols, &c.  
 Capt. J. Vivian, for North Roskear.  
 Mr. Vivian, Condour.  
 Capt. Evans, North Pool.  
 Mr. Dennis, East Pool.  
 Capt. J. Davey, Wheal Buller, &c.  
 Capt. J. Richards, Consols.  
 Capt. W. Marriott, Trevelyan.  
 Capt. W. Richards, for East Consols.  
 Capt. Puckey, for Fowey Consols, Par Consols, and other mines.  
 Capt. Champion, for East Wheal Rose.  
 Capt. Peter Glynn, for South Caradon, &c.  
 Capt. Blight, Great Work United.  
 Capt. White, Alfred Consols.  
 Capt. Thos. Trevelyan, manager of St. Ives Consols, Wheal Margaret, East Margaret, and other mines. (He had seven or eight dividend mines at the same time.)

The managing agents of Botallack, Levant, West Providence, Wheal Providence, Wheal Clifford, Wheal Jewel, and a score of other mines; all of whom are equally entitled, with Capt. C. Thomas, to thank-offerings.

But for the high prices of copper and tin, no such testimonial would have been given. I write from no ill-feeling—Capt. Thomas is quite welcome to the plate; but wish to see other equally deserving men better paid, at least, for their services.

Cornwall, Feb. 25. A. CLERK.

### "ANOTHER LEGAL MISTAKE"

Sir,—As you published a letter, signed "Veritas," in your Journal of Saturday last, and induced to believe you will do me the favour to insert this reply to it in your next. The ostensible motive for your correspondent's "appeal to the humane," is to assist the widow and family of a deceased miner; the true object, the opportunity thus afforded for repeating unjustifiable attacks on the character of Mr. John Taylor, son, as manager of the Goldeneye Mines. It is strange "Veritas" should now require to be told that Mr. John Taylor's reputation for experience and judgment in mining affairs is on too secure a foundation to be affected by his vindictive and impulsive efforts. However, as he has thus publicly endeavoured to throw odium on Mr. John Taylor for his conduct towards the deceased Harry Lowdon, permit me to state my version of this affair.

Lowdon was employed as a miner in 1849, when the works under the present lease were begun. On the appointment of Mr. John Taylor to the management of the Goldeneye Mines, by order of the Court of Chancery, Lowdon was retained in the same employment, and continued to work, under Mr. John Taylor's direction, until influenced by craftiness and design, he became disobedient to orders, unskillful in his superiors, frequently absent from work, and the fabricator of false reports to the late manager respecting the then working of the mines, and also addicted to drinking, in consequence of which he was discharged.

The former manager then made application to the Master in Chambers to have Lowdon reinstated in his situation. The facts of the case were heard, when it was decided, as usual, that Mr. Taylor was right.

There is no entry in the cost-book of Lowdon ever having been made captain under the former management, nor is it probable he was so appointed, as he could neither read nor write. That the former manager induced Lowdon to act as he did no one doubts. It was that gentleman's intention to deprive him of his wages, and to secure for himself the future management of the mine, and to sacrifice his situation, his future prospects, and himself. It is to that gentleman, therefore, that the widow and children of the deceased should now look for that substantial support and assistance which it is highly improbable they will obtain from a public "appeal to the humane."—March 4. T. H.

The PERMANENT WAY COMPANY have issued a few observations in reference to the discussion which took place at a recent meeting of the Institution of Civil Engineers, so as to remove any erroneous impressions which may have arisen in the mind of the public. About 1848 it became evident to all connected with railways that the permanent way as then constructed was insufficient for the increased weights and speeds. Various suggestions were made, and patents obtained, by engineers and others with this object, and thus a competition arose in which the interest of the engineer in his own patent might be suspected to interfere with his sound judgment on the merits of any other invention; inventions, therefore, which are now acknowledged as important improvements, were but slowly introduced. Under these circumstances it was suggested by the friends of those engineers who, it was thought, possessed the best patented inventions, that great advantage would result from their mutual co-operation. It was argued that it would relieve them, as professional men, from the suspicion of an undue bias in favour of their own particular inventions, and from the expenditure of time necessarily absorbed in the introduction of any improvement, and enable them, by meeting and discussing the various questions connected with permanent way, to devise and establish further improvements, while an advantage would result to railway companies in being able to treat with an association which could offer them the selection of many recent improvements, instead of their having to deal with several separate patentees, whose interests might be conflicting. The result has been that in five years nearly 6000 miles of single line have been laid under one or other of the combined patents by the advice and direction of engineers having no interest whatever, direct or indirect, in the property of this company, and this they hold to be undeniable evidence, not of the individual interest or influence of the members of the Permanent Way Company, but of the actual utility and advantage of the system which they have selected and brought under the notice of engineers and the public. Some of the establishments of the company so large a proportion of the regular working charges were common to the promotion of one or many patents that they were enabled to offer their use at greatly reduced royalties, as compared with what were charged when the inventions were held in separate hands. The case of 20 engineers, each having a patent as compared with the same 20 engineers working the 20 patents in common. In the first, each engineer is strongly interested in getting his own patent used, and let him be ever so well-intentioned that interest must have a certain effect upon his judgment. But, in the second case, he is only interested to the twentieth part of his patent, and has 20 patents from which to choose; and further, his interest becomes so much reduced that it ceases to operate upon his judgment in any sensible degree—he is, in fact, so little out of pocket by using some construction not under any of the patents that his judgment is no longer fettered. But more than this, although each of the patents in itself may be of comparatively little value, yet most valuable results may arise from their combination. On this point they quote the evidence given by Mr. Ricardo, the Chairman of the Electric Telegraph Company, to the Patent Law Amendment Committee of the House of Lords in 1851, in which he stated that that company had adopted many patented improvements in connection with their telegraph; that they had been very successful in most instances valuable in themselves, but in combination with others, which they had, they might be made useful; they had found, after every possible experiment, that the system of needles was by far the best for all practical purposes; it was clear it was their interest to have the best they could find. There was not one invention which is not brought to the company before it was started against the company, and they had expended nearly 200,000l. in buying patents and litigation, but they found after all, that the original patent was by far the best and most suitable for practical purposes. They gave a large sum (140,000l.) for that patent. The position of the Permanent Way Company is this—They hold many patents, and among them many of the greatest utility, but they are ready to receive more if they are likely to be useful; it is their interest to obtain the best and most important improvements, to carefully watch every symptom of defect and devise the remedy, and to divulge their ideas and experience one to another. Both inventors and the public, therefore, reap infinite advantage from the operations of the company.

BRITISH CHRONOMETER-WATCH AND CLOCK COMPANY.—We have already referred to the great improvements in chronometers and other time-keepers, effected by Mr. George Phillips, C.E.; and a company has just been formed under the name of "Joint-Stock Companies Act, 1856," with limited liability, for effectually developing the invention. All time-keepers on this principle show dead half-seconds, require no oil to the escapement, can be manufactured at much less than the ordinary cost, and are less liable to derangement. In watches the chain, fusee, maintaining-power, and escape-wheel are superadded; in the railroad time-keeper the vibration of the carriages produces no derangement; in clocks the pendulum is dispensed with. As a commencement of business one firm alone has engaged to take a gross of watches per week, and the prospects of the company are, otherwise, extremely good.

## Meetings of Mining Companies.

### NORTH WHEAL ROBERT MINING COMPANY.

The quarterly meeting of shareholders was held at the offices of the company, Bishopgate-street, on Monday.—Mr. JOSEPH PROCTOR in the chair.

Mr. MURCHISON (the secretary) read the notice of meeting, the minutes of the last, and reports upon the mine by Capt. Pope, of Bassett, and Mr. Wolferstan, the manager. The former has already appeared in our Journal, and in the latter he says:—"We sampled on Friday last 105 tons of good quality ore. The next sampling will be about the same, and the succeeding one we hope will be at least 120 tons."

Letters from Capt. Pope and Capt. Jas. Richards (the manager of the Devon Great Consols), recommending that the ore ground should be worked on tribute, instead of by stoping, having been read, Mr. Wolferstan contended that, in North Wheal Robert, they would be obliged to continue stoping to some extent, as the lode must all come to surface, and be selected; and if such work were set on tribute, the men would only take away such portions as would pay them at the tribute they had agreed to; and when the next setting day arrived, they would have to re-set the bargains at another tribute, so as to get the remainder removed. He agreed with the recommendation to set on tribute where it was practicable, but he contended that, in North Wheal Robert, except for those pitches which were already set upon tribute, tribute was preferable—that being most likely to yield profit to the shareholders. If they could not set under a certain amount in the pound, tribute was best.

Capt. Wm. Richards (of Bassett Mine) agreed with Mr. Wolferstan that there was a limit, beyond which tribute was not desirable. He considered, if they could not set at 11s. or 12s. in 17, it was not worth while setting at all; but he liked as much tribute as possible when it could be profitably set, as it gave the men more encouragement, and where the lode was large and banchy, as at North Wheal Robert, tribute was the best. Besides which the men kept the ore cleaner, and raised it all; while by stoping they cared only for the quantity of ground they broke for measurement day.

Mr. Wolferstan said, they had now six tribute pitches set, and he did not see that they could set tribute bargains in the immediate vicinity of their stopes and ends, as loss was always the result of such a proceeding.

Capt. Richards thought men would take pitches at a fair tribute, and their energy was certainly greater when on tribute than on work. He had known men to work twelve hours a day, instead of eight, and to get through twice the ordinary amount of work in a day when the tribute turned out well. This, of course, brought extra profit to the adventurers.

Mr. HAND drew attention to Capt. Pope's report, in which he stated that the whole of the eastern mine should be set on tribute, and if this were done Capt. Pope observed that they could pay dividends at once. He (Mr. HAND) therefore moved that Capt. Pope's advice be adopted.

Mr. HANCOCK enquired whether they adopted tribute at the mine as a rule, or as an exception?

Mr. Wolferstan said, there was more tribute than tribute in the mine.

Capt. Richards understood the ventilation was bad; and although he believed they had lost some of their best men by emigration, he believed that, if the mine were better ventilated, they would have better men. Men would not, nor could they be expected to, work in places where they were stifled.

Mr. Wolferstan promised that they would prosecute the tribute to a greater extent than at present, but they must improve their ventilation. In some places in the mine, one had absolutely to get along on his belly, and there could not be good air behind such placation. The attic had not been properly removed, and the consequence was that they were choked up. They had now a new captain, and he had no doubt they would get on better.

A SHAREHOLDER suggested that it was evident there was room for improvement, and was surprised that Mr. Wolferstan had allowed the mine to get into so bad a state of ventilation as he admitted it to be in.

Mr. MURCHISON then read the statement of accounts, which showed—

Balance last audit	£39 9 1
Ores sold	2941 17 3
Carriage and sundries	111 9 2 = £3092 15 6
Labour cost	1787 9 11
Merchants' bills	1005 14 2
Dues	138 11 10
Office expenses, printing, &c.	55 1 10 = 2987 0 9
Leaving balance in favour of mine	£105 14 9

It was estimated that the balance at the next meeting would be 529l. 11s. 6d.—The reports and accounts were then received and adopted.

Mr. HAND having withdrawn his motion upon the understanding that every exertion should be made to introduce the tribute system into the mine, as the cheapest mode of working the ore ground, it was resolved that "this meeting is of opinion that, as far as practicable and beneficial, the ore ground should be set upon tribute." The dismissal of Capt. Pryor and the appointment of Capt. Godden were confirmed, and thanks voted to the Chairman.

### BENDERG MINING COMPANY (LIMITED).

A general meeting of shareholders was held at the offices of the company, Great Winchester-street, on Wednesday.—Mr. PACKER in the chair.

The SECRETARY read the notice convening the meeting, and the minutes of the last, which were confirmed.

The directors' report stated that since the formation of the company (eight months since) the works had been pushed on with as much speed as possible. Machinery was dispatched to the mine in July, and the erection of it completed towards the end of Oct. Since then the engine-shaft had been sunk about 9 fathoms, and a wine-shaft about 7 fms., and the captain's residence and storehouse completed.

A statement of accounts, from Jan. 25, 1856, to the end of Feb. (duly audited), was submitted, from which the subjoined is condensed:

Received for shares allotted	£810 0 0
Sundries	78 18 6 = £888 18 6
Mine cost and machinery	682 12 0
Registration of company	0 0 0
Secretary's salary, rent, stationery, &c.	72 1 5 = £239 13 5

Leaving balance at banker's.....£ 59 5 1

In the estimated account of assets and liabilities the balance in favour of the company was 32l. 3s. 3d., exclusive of machinery and unallotted shares.

The captain's report was read as follows—

Feb. 28.—I beg to hand you a report of our operations since the general meeting held Dec. 1. The engine-shaft is sinking on the lode, and has been sunk 6 fms. 1 ft. below the 14 fms. 5 ft. below the adit level; the lode is 4 ft. wide, composed of quartz and prisms, with very rich stones of ore; there are veins, or feeders, of ore falling into it, which speak well for a good lode below us. The winze has been sunk 5 fms. 2 ft., and is down 12 fms. 1 ft. below adit. The lode here is 6 ft. wide, consisting of soft quartz and broken, and good stones of ore, and is altogether very promising; this winze is supposed until we drive our next level, when it can be sunk much deeper. We propose sinking to the 18 fms. below adit, then to cut, east and west, and divide shaft, and erect hauling machine, and drive a level east and west on the course of the lode. About 25 fms. west of shaft the Bend and Benderg lodes form a junction, and here I am told a good lode of ore has gone down, and good results may be expected. We are doing our best to prove the mine, and I can, with confidence, say that you have a property with every appearance of its becoming most valuable in depth.—N. TOSK.

The report and accounts were unanimously adopted.

The CHAIRMAN stated that so confident were the committee of having a valuable property, that among themselves, as a committee, they had purchased nearly one-half the shares that had been issued. They were determined to press forward the work with all possible speed, and for that purpose they were sending out additional Cornish miners and machinery.

In reply to a shareholder, it was stated that no free shares had been issued, and that the directors and auditor gave their services gratuitously, the committee being determined to devote the whole of the company's capital to the legitimate purpose of proving the mines.

Mr. HOBLEY moved that the committee (consisting of Messrs. Badenock, Curry, Halse, Packer, and Thornthwaite) be re-elected. He felt every confidence in the committee, and was fully satisfied with the progress made. He thought the prospects of the mine were such that the committee should not issue any further shares to the public in general unless the money was absolutely required.

Mr. HUTTON seconded the resolution, which was carried unanimously.

Mr. Paris having been re-elected auditor, the meeting terminated with a vote of thanks to the Chairman, committee, and captain.

### EAST PROVIDENCE MINING COMPANY.

A general meeting of shareholders was held at No. 4, Cushion-court, Old Broad-street, yesterday.—Mr. N. HARVEY in the chair.

The SECRETARY having read the notice convening the meeting, it was resolved unanimously that the mine be forthwith divided into 2048 parts or shares, instead of 16 shares as heretofore; that Mr. James Hollow be appointed purser, at a salary of three guineas per month; that Mr. Hollow, sen., be appointed agent at a salary of two guineas per month; that Mr. George Eustace be appointed engineer of the mine; that Messrs. Bolitho's, Sons, and Company, of Mount's Bay Bank, Penzance, be the bankers of the company.

The following report from Mr. Hollow was then read:—

March 6.—These mines are situated in the parish of Uny Lelant, and adjoin the Providence mines on the east. The lode from the former traverses the sett, which is very extensive, being about half a mile square, and unlimited in extent. The sett has long been known to be valuable. Some five years since it was taken by a party of working miners, who drove a deep adit from the sea-shore towards the Providence lode, but did not cut it; and sunk a shaft on the caunter lode, about 10 fathoms from surface. From the last 3 fathoms they broke and sold about 20l. worth of tin, at 40l. per ton. This would now be 40l. worth—or, say, 13l. per fm. At that depth they were stopped by water, and could go no further without an engine, which they were unable to erect. Since that time this mine has not been worked, although sought after very much, the aged owner refusing to grant, until the present proprietors made application. This sett is traversed by many other lodes than those shown in the plan, but those only have been laid down whose bearings have been properly ascertained. There are several ancient adits driven into the sett on lodes, and in most cases the backs have been stopped for tin. On one, the Wheal Smith lode, some rich tin stuff has been broken. A copper lode has been discovered, and some rich specimens of copper ore and gossan (produced) broken from it, near the surface. The Providence workings, on the south lode, are very near this sett—say, 50 to 60 fms., and operations will be commenced on the same lode in this sett. There is a shaft sunk on it by the ancient workers, and at or near this shaft there is an intersection of the caunter (referred to above) and another lode with it; so that here also very good results may be expected. For the efficient working of the mine, a pumping-engine of about 30-in. cylinder, with stamps attached, will be required; and with a seasonable outlay, speedy profits and large dividends may be expected.

Reports were also read from the agents of Providence Mines, Wheal Kitty, Keeth Consols, &c., giving highly favourable prospects of the adventure, which they were of opinion was a good speculation, and when fairly laid open would make a very productive mine.

The reports were unanimously adopted, and it was resolved unanimously that the purser and engineer be requested to look out for a suitable engine, with stamps attached; and that the aged owner be instructed to consent to immediate and vigorous operations, so that no time be lost in developing the mines; and that the meeting of the

adventurers, for auditing the accounts, and the general business of the mine, be held in London every three months.

A cordial vote of thanks to the Chairman terminated the proceedings.

### MEXICAN AND SOUTH AMERICAN COMPANY.

The general meeting of proprietors was held at the London Tavern, Bishopgate, on Tuesday.—Mr. H. W. SCHNEIDER in the chair.

The SECRETARY read the notice convening the meeting.

The CHAIRMAN said, the quantity of regulus for the twelve months ending Nov. 30, 1856, was 52,778 quintals, or 2399 tons, average per month 4798 quintals, or 218 tons, and the vessels that brought ore to this country, from Jan. 1, 1856, to the present time, was—regulus, 2945 tons 12 cwt., yielding of fine copper 1818 tons 3 cwt. 2 qrs. 2 lbs. It would be seen, by the accounts, that there was a great loss upon the previous year, which arose from Mr. Allison largely increasing the smelting operations previous to forming a new company at Herdrada, to compete with the Mexican and South American Company; and the quantity which Mr. Barnes had smelted was of a very inferior quality, but it was necessary he should have a large stock of ore on hand, as in Chili they must make contracts at a certain period, or they would be left without a supply of ore. Mr. Barnes had succeeded in reducing the debt due to Messrs. Huth and Company, notwithstanding the greater proportion of the ore he had smelted was of a very low produce, and for which the same amount of labour and coals was required. He (the Chairman) had every reason to believe that the establishment was now in a satisfactory condition, and that there were fair and reasonable grounds that they could continue to work to advantage. Mr. Barnes had got rid of all the poor ore, and was now working upon richer, and the general prospects of the company had improved, and he did not anticipate any great success during the current year. The present meeting was not one at which the accounts would be presented; but he was sorry to inform them that a very serious error had been made in the accounts that were laid before them at the last annual meeting, which amounted to no less than 12,000l. to 13,000l., and which no caution of the directors could have guarded against, as it arose through 59,000 quintals of ore being sent to Caldera in 1855, which was charged in the Herdrada account, and no trace of it was discovered until the end of the year, when Mr. Barnes took charge of the accounts, and upon making them up showed a deficiency of 500,000l. He was glad to inform them that at Herdrada, by the careful manner in which the operations were now conducted, they had succeeded in reducing the average loss to 1/4 per cent., and hoped even to reduce that amount.

Mr. ENTHOVEN wished to know whether the slugs had been abandoned with 500 tons of ore in them?—The CHAIRMAN explained that in Chili, through the expense of coals and labour, they could not afford to re-smelt the slugs. He was glad to say they had now got rid of the debt in Chili, and he looked forward with a great deal of confidence to the future.

Mr. WAGNER said it might be a satisfaction to the meeting if the Chairman would state that the pamphlet of Mr. Allison's could be refuted.

The CHAIRMAN said a full and complete answer had been given to the pamphlet, but it was so long that they had not published it; however, it was open for inspection by any shareholder at the office.

Mr. BALSTON said, as the pamphlet of Mr. Allison had gone forth to the public he considered it desirable that the answer should be published.

The CHAIRMAN considered it would be derogatory to print it; but if it was the wish of the proprietors the board would not oppose its publication—(no, no)—as they might get involved in a paper war, which it was impossible to tell where it would end. With regard to the pamphlet, he would remind them that in 1851 Mr. Allison reported the loss in slags as 16 tons, in 1852 he had gained 8 tons, and in 1853 he reported he had lost 1 1/2 ton, making in three years a total loss in slags of under 10 tons. In the pamphlet, then, before them, he made it upwards of 200 tons, but the stock as resulting from this was a myth, for the total loss turned out to be upwards of 550 tons, or about 1 per cent. in all the ore.

The proceedings then terminated with an unanimous vote of thanks and entire confidence in the directors, the Chairman observing that they were deeply indebted to Mr. Ward, the managing director, and to Mr. Ranking, for their untiring exertions on behalf of the company.

### GOVERNMENT SCHOOL OF MINES.

Mr. Warrington Smyth continued his lecture on the Ventilation of Mines on Tuesday, and more especially alluded to the subject of natural ventilation. When collieries extended to a great depth, there was always at the furthest workings a higher degree of temperature than at the surface, and instanced by diagrams the different temperatures of the air at various points in the workings, as well as at the surface, when two shafts were near together. At the time of the quinoxes, this might be a point of some danger; the ventilating current would be a change of air materially affected. There were many places where it was not secure to proceed without a safety-lamp, and in every case strict discipline should be enforced. There was a great difference of opinion between colliery viewers as to the size the shaft ought to be constructed. Some said the upcast shaft should be smaller than the downcast. They were aware that the large chimneys of manufactories were generally smaller at the top than at the bottom. An objection to this principle was, however, reversed this principle, and found that it had answered the purpose better than the old method. It was considered preferable that the upcast should always be of larger dimensions than the downcast shaft. Natural ventilation was always desirable whenever it could be obtained; but when it was required to resort to artificial means, great care should be taken in laying out the workings. Several diagrams were then shown of the passages of the currents of air, and ably illustrated by the lecturer. In course of the description, Mr. W. Smyth pointed out the several places where the wind was likely to occur, and lucidly explained the plan of the reversal of the air, and other causes leading to explosions. In some of the workings, at the top of the chimney shaft, there was placed a cowl, and this was found of great utility.

The lecturer next alluded to the practice pursued in the smaller works in Flintshire. The system of using brattices in shafts was always dangerous, however airtight they might be supposed to be, it would be found there would be always interstices between the planks, by which the air in the upcast and that of the downcast would mingle. Several diagrams of brattices were then shown and explained, as well as a method which had been introduced by Mr. Gibbons, of South Staffordshire, and which was not to be recommended. Mr. Smyth then alluded to the method of passing the air down brick shafts, and by the aid of diagrams showed the various modes in which this was performed, as well in those workings as in those of different construction. In some mines air boxes, made of wood, either round or square, were used; but there was a great objection to these, as they were apt to be stopped up by fungi. Zinc pipes were sometimes employed, but these required a great deal of care. Pipes of cast-iron were in general use, but these were of some weight and of a small diameter. In some of the mines on the Continent they had introduced pipes of paper mache; these, however, quickly absorbed all sorts of humidity, and were in a comparatively short period of time entirely useless.

The lecturer next drew attention to the ventilation of metallic mines, and showed how much more facile it was to control the ventilation of these than collieries. There was a current of air always between the shafts and levels, and when this was deficient a communication was carried on with winzes. A diagram was shown how the air could be carried to the end or a level where it was dealt. The means of carrying air by double leathers in collieries was then pointed out, as well as the general system of air-ways, or air-bricks, of these were very small, and in many cases they were of such diminutive dimensions that when a fall of coal occurred they became clogged. The system of working the thick coal at Dudley, by opening at intervals, was then described. The method in which the communication at Schemnitz had been carried out between the Zipser and the Seglberg shafts was then alluded to. Here the adit had been carried 1600 fms. by a system of double levels. A description of the mode of ventilation at the Pyszlau mines, in Bohemia, was then given, and the lecture concluded.

### BRISTOL MINING SCHOOL.

Robert Etheridge, F.G.S., gave his second lecture on Geology on Monday. His first lecture was confined to the primary rocks, purposely leaving the old red sandstone for the commencement of this, his second lecture, as with it were connected many interesting and important particulars to which he wished to direct attention. On this occasion he would confine his remarks to the secondary rocks, and endeavour to say as much respecting them as he possibly could in one lecture, as their geology was so important to the interests of most of his audience. The only difference at once recognizable between the old and new red strata was that of their inclination, the former being always found much inclined, whilst the latter was almost invariably pretty nearly level. There were no fossils in the old red of Bristol, as were to be found in that of Scotland. The cause of this difference had been a matter of considerable difficulty to many, but it was evidently because of the oxide of iron in the former, this being quite sufficient to obliterate all organic remains. The new red sandstone, or Permian bed, was classed by some with the coal measures, and this not at all improperly, as colour had nothing whatever to do with the age or class of rocks. No one could tell the difference between old and new red sandstone simply from the colour; the fauna and the flora of the Permian bed, both in this country and in Germany, were the same as in the coal measures, hence the propriety of their being classed together. Below the Harlech grit no order of superposition was to be observed, as granite, boulders, gneiss, &c., were to be found in all imaginable positions with respect to each other; but above this there was an invariable order of series. It is not to be supposed that the strata would always be found in their places. In Belgium, true coal was found resting on granite; and in France was not in its normal condition, but owing to the granite in that place being dry land at the time when the coal was deposited. It would, however, find it all as fruitless to search for coal above new red sandstone, or lie above the collieries. The Forest of Dean and Bristol coal fields were a perfect type of all conditions and accidents of carboniferous strata, so various were the dislocations, and so multifarious the facts and problems, that—as had been observed by De la Beche—for the student to know these was to know all the conditions of coal measures. The new red sandstone was the overlie in this district, but in the North this was the mass of the Permian bed, between the new red and the coal strata in this district, was to be found a bed of conglomerate. Coal was found interstratified with arenaceous calcareous shales. It was beyond all question of vegetable origin; vegetable fibrous tissue was to be clearly seen, in thin laminated coal, by the aid of the microscope, and various species of conifer were abundantly developed. Coal was but a mass of mineralised vegetation; and, under favourable conditions, submerged peat-mosses, junipers, &c., would form similar mineralised deposits. Indeed, what had been done on a gigantic scale by Nature, would on a small scale be effected artificially. There were two ways of accounting for the formation of coal—one by vegetable matter being precipitated in lakes and estuaries, the other by the subsidence of vast tracts of low marshy land, on which vegetation had been densely luxuriant. A very considerable change of climate had undoubtedly taken place since such submersions, as to produce this kind of vegetation required a tropical climate. This was, no doubt, owing to a positional change of the earth's axis, as coal was found to exist from the North Pole to the Equator.

The coal measures of the Bristol coal field were divided into upper and lower by the Permian sandstone, which was known as the brown, blue, and grey Pennant. The lower series would most probably never be worked, because of the giant here-power that such would require to be found to be at right angles to the seam, the faults were, therefore, if the fault should be found to be at right angles to the seam, the coal through the fault would be in a line with the driftage; but if the fault made an acute angle with the roof of the seam, the corresponding seam through the fault



would be found considerably below the line of drive, and vice versa. When these faults were very thick, and consisted of trap-rock, they were called dykes. Such was the 30 ft. dyke of the Newcombe coal field. In Cornwall, the disturbing force causing dislocation of the lodes and veins, had exerted laterally, whilst in coal beds it had been nearly vertical.

Mr. Etheridge had prepared a very interesting exhibition of diagrams and specimens to illustrate the facts of geology. He extended his remarks to the lisa and the scottie, giving also many interesting particulars respecting the salt of the new red, and concluded by observing that the geological student must ever keep in mind the sequence of life as well as the sequence of rocks, and the marvellous vicissitudes of climate, if he wished to study intelligently.

**GEOLOGY.**—Prof. Phillips delivered his sixth lecture on geology at the Royal Institution, on Saturday. This course of lectures is divided into three parts, the first of which comprises ancient physical geography, to which three lectures were devoted; to the second part "on the origin and progress of life on the globe," four lectures were appropriated; and the remaining three will be "on the limits of variation in the state of the globe." In the lectures comprised in the second part, fossil plants and invertebrate animals were considered, and in the lecture on Saturday fossil vertebrate animals, including fishes and reptiles, were the subjects noticed. At the period these animals lived on the earth there must have been land, sea, and an atmosphere; and as regards tortoises, which are abundant in some of the strata above coal, their remains indicate that the temperature of this part of the earth, when such creatures lived here, was much higher than it is at present. Respecting the origin and progress of fishes on the globe considerable difference of opinion exists. No fossil remains of any fishes are found in the lowest rocks. The first traces of them occur in the upper parts of what is called the upper Silurian formation, and these but few and indistinct. In the next series of strata—the old red-sandstone—there are the remains of several kinds of fishes; but their organizations are so unlike those of existing species that it was at one time doubtful whether they belonged to that class of animals. The most perfect remains of fishes are found in the magnesian limestone above the coal formation, and Mr. Phillips observed that the abundance and perfect preservation of fishes in that stratum lead to the conclusion that they were destroyed by some changes in the constitution of the atmosphere that rendered it incompatible with animal life. The conformation of the tails of fishes affords a distinguishing characteristic of those found in the lower from those of the tertiary strata. The tails of the fishes whose fossil remains are found in the older rocks are formed on the plan of those of the shark, with the vertebral column extending to the termination of its upper division, which form in existing fishes is the most rare. It has been found, indeed, as a general rule, that the groups of fishes most plentiful in existing nature are those most rare in ancient rocks. Of the four classes of reptiles—frogs, tortoises, serpents, and lizards—the remains of tortoises are found lower than those of any other of this class of vertebrate animals. They are abundant in the new red sandstone, where their footprints are marked on the sands that once formed the shores of ancient seas. Of the frogs there are several varieties, and Mr. Phillips exhibited a drawing of a fossil frog, with an imperfect development of arms and legs, and with the tail still attached, which former geologists considered to be a relic of antediluvian man, and dignified it with the Latin appellation *homo testis diluvii*. The fossil remains of serpents are somewhat scarce, the chief deposit of them in this country being the upper tertiary strata near Colchester. Of the lizard tribe there are abundant specimens in the lias strata. Mr. Phillips described, at some length, the monstrous saurians, the ichthyosaurs, the iguanodon, the megalosaurus, the remarkable long-necked plesiosaurus, and the flying pterodactyle; and he pictured the condition of the country of Sussex, where the remains of these creatures abound, at the time they were living. It is evident, he said, from the abundance of these fossil remains and from their known habits of life, that that part of the country must have been the estuary of some large river that flowed through a land now unknown. These monster lizards became extinct before the chalk formation. The subject of the next lecture will be the history of fossil birds and mammals.

### THE INDESTRUCTIBILITY OF FORCE.

Prof. Faraday's exposition, at the Royal Institution, of the principle of the conservation of force, is calculated to produce much controversy among scientific men, for if the principle can be well established, it will open new views of the action of forces in general, and will constitute an important epoch in the history of science. The view taken by Prof. Faraday of the indestructibility of force is not, indeed, altogether new; but its adoption by a man of such eminence bestows on it an importance which it did not before possess, and seems to stamp what might have been considered fanciful speculations with the impress of truth. Several scientific investigations of late years seem to lead to the conclusion that all the varied forces of Nature are but modifications of one general force; and as some of those forces are acknowledged to be indestructible, it seems a rational inference that the whole of them must be so. Heat, for example, exhibits the properties of indestructibility which Prof. Faraday asserts belongs to all forces whatever. It may be diffused, and undergo every kind of transmutation, but the original amount of heat remains, and may be reproduced, after undergoing all conceivable changes. A red-hot ball, for instance, if plunged into water, soon becomes cold, but it imparts to the water, and to the steam that issues from it, a degree of heat equal to that which made it incandescent. That instance of the diffusion of heat, without any loss of heating power, affords an illustration which is applicable to every case in which heated bodies are cooled—the heat passing from one body to another, but the sum of it remaining the same, however much it may be diffused. A burning candle presents a reverse illustration that heat cannot be created. There appears, indeed, to be a continuous generation of heat during the burning of the candle, but it is well known to be only an effect of transmutation under the influence of chemical action—the heat evolved during combustion being obtained from the oxygen of the atmosphere, which gas is condensed by conversion into vapour during its combination with the hydrogen and carbon of the combustible. Chemical science proves the indestructibility and the transmutation of heat so conclusively, that if that force alone were considered the representative of all the others, the principle of the conservation would be no longer doubtful.

The close relation between heat and mechanical force has for some time past been shown by Mr. Joule, who proved that every effort of mechanical force evolves a proportionate degree of heat; and those who have pursued the investigation have gone so far as to measure mechanical effects by their equivalents of heat generated, or, as we should rather say, disturbed. Mr. Grove, and other scientific men, again, have contended for not only the relation of all the physical forces, but their identity; and if the identity of heat and the other forces can be established, there would follow, as a necessary consequence, the proof of the principle of the conservation of force contended for by Prof. Faraday. Not, indeed, in the manner suggested by Mr. Babbage, in his supplementary Bridgewater Treatise, of an eternal repetition of the same force, so that, as he conjectured, one of the torments of a murderer in the next world might be hearing incessantly the sound of the blow by which he killed his victim. The modes of the conservation of force, as propounded by Prof. Faraday, may be infinitely varied. The force of a blow may be preserved in heat, may afterwards take the form of electricity, magnetism, chemical affinity, or gravitation, and in the course of events may reproduce itself again and again in the form of a blow.

Prof. Faraday, in his treatment of the subject, seized the bull by the horns, and at once proceeded to consider the application of the principle of the conservation of force to gravitation, in which it appears to be least manifest, because if it can be established in gravitation there would be little difficulty in its application to other forces. A single lecture, of an hour's duration, was not, however, sufficient for the full development of Prof. Faraday's views, and most of those who heard him on Friday night must have thought that the difficulties attending the consideration of the properties of gravitation were more strongly stated than clearly elucidated. It would have been more satisfactory, also, if he had described the nature of the recent researches which have led to the important conclusions at which he arrived. He was, indeed, obliged, from want of time, to omit a large portion of what he had written for the occasion, and to this most probably must be attributed the want of further elucidation respecting the application of the principle of conservation to gravitation. Of the truth of the principle, however, Prof. Faraday expressed no doubt; and when the paper is published at length, as no doubt it will be, the seeming obscurity may be removed. The recognition of force as existing from all time without increase and without diminution, and as indestructible as matter, would open a vast field for inquiry and speculation in all branches of science; and if the principle be generally admitted, many theories and systems of philosophy now regarded as established must be overthrown.

**GALVANISM AND ITS ECONOMICAL APPLICATION IN THE ARTS.**—A committee has been formed in France to examine and report on the merits of the competitors for the prize of 50,000 frs. (20000. sterling), offered by the decree of Feb. 23, 1852, for the discovery of a means of rendering the galvanic battery commercially applicable in the arts, either as a source of heat or light, or as a mechanical power, or as a chemical or medical agent. The committee consists of MM. Dumas, President; Chevreul, Polonceau, Regnault, Despretz, Rayer, Serres, Charles Dupin, Sequier, Poncelet, Morin, Members of the Academy; Reynaud, Director of Lighthouses; and Henry Sainte-Clair Deville, of the Normal School.

**BRIDGES AND GIRDERS.**—The seventh part of Mr. Humber's "Practical Treatise on Cast and Wrought-Iron Bridges and Girders," as Applied to Railways and to Buildings Generally, contains plates of Mr. Cubitt's Great Northern Railway Bridge, Biggleswade, and Mr. Humber's Tubular Girder Bridge, over Lough-Atalia, on the Midland Great Western Railway, Ireland, with descriptive particulars of several other important works.

**LONDON GENERAL OMNIBUS COMPANY.**—The traffic receipts for the week ending February 28 were 10,648, 7s. 1d.

### STATISTICS OF RAILWAYS.

More rails are laid down than are enough to form a bolt of single iron rail round the globe.

The extent of railways now (1856) completed in Great Britain and Ireland is 8054 miles.

These lines have cost 286,000,000.

There are more than 50 miles of tunnel.

There are 11 miles of viaduct in the neighbourhood of London.

The earth-work of the railways measures 550,000,000 cubic yards.

The earth thereto would form a pyramid a mile and a half in height, with a base larger than St. James's Park.

Eighty millions of miles are in the course of a year run by the trains.

There are 5000 railway engines, and 150,000 working vehicles.

The engines in a line would extend from London to Chatham. The vehicles from London to Aberdeen.

The various companies employ 90,000 officers and servants.

The engines consume annually 2,000,000 tons of coal.

In every minute of time, four tons of coal convert into steam 20 tons of water.

In 1854, 111,000,000 passengers were conveyed upon railways; each of whom travelled an average of 11 miles.

The receipts of the railways in 1854 amounted to the sum of 20,215,000l.

The receipts of every railway have continued to increase.

20,000 tons of iron require to be replaced annually, on account of "wear and tear."

26,000,000 of wooden sleepers require to be replaced yearly.

300,000 trees are annually felled to make good the decay of sleepers.

300,000 trees require for their growth 5000 acres of forest land.

Trains carry upon an average 200 passengers.

The cost of running a train is under 1s. 3d. per mile.

50 passengers at  $\frac{3}{4}$  of a penny per mile, produce 5s. 2d. per mile.

But for the facilities afforded by railways the penny postage scheme could not have been carried out.

70,000,000l. of money have been paid to landowners and others, as compensation for property interfered with by the lines.

The Electric Telegraph extends over 7200 miles, requiring 36,000 miles of wires.

3000 persons are employed by the Electric Telegraph.

40,000 men are employed indirectly.

1 in 50 of the entire population of the kingdom are dependent upon railways.

The annual receipts of railways has reached 20,000,000l. which is nearly half the amount of the ordinary revenue of the state.

The saving of a farthing a mile in the expense of running the trains would make a difference of 80,000l. a-year to the railway companies.

### RAILWAY TRAFFIC RETURNS.

The railway traffic returns for the past week, as compared with those for the same period last year, show the following results:—

ENGLAND.—The returns on English lines are:—	1857.	1856.
London and North-Western	253,732	243,553
North-Eastern	30,391	28,369
Midland	22,793	27,204
Great Western	21,234	22,933
Eastern Counties, Norfolk, and Eastern Union	22,572	19,946
London and York	22,538	20,729
Great Northern	21,756	20,019
South-Eastern	14,375	14,246
London and South-Western	11,676	12,505
London and Brighton	10,512	10,234
Shrewsbury and Hereford	10,209	9,350
North British	9,048	—
Manchester, Sheffield, and Lincolnshire	8,803	8,173
London and Wolverhampton	6,953	6,587
West Lancashire	6,120	6,100
Lancaster and Carlisle	5,450	4,999
Bristol and Exeter	5,109	4,949
Chester and Holyhead	4,884	4,227
Oxford and Wolverhampton	3,701	2,209
Newcastle and Carlisle	3,262	3,065
West Hartlepool Railway and Harbour	3,064	2,678
Shrewsbury and Chester	2,704	2,355
Monmouthshire	2,202	2,050
Birkenhead, Lancashire, and Cheshire	2,172	2,160
North London	2,142	2,026
South Devon	2,073	—
Shrewsbury and Birmingham	1,742	1,360
London and Blackwall	1,483	1,214
Blyth and Tyne	1,213	1,293
Newport, Aberystwyth, &c.	1,000	946
East Anglian	975	773
London, Tilbury, and Southend Extension	900	731
Blackburn	854	740
Manchester and S. Junction	814	679
Shropshire Union	715	636
London and Cornwall	1,183	696
Lancaster and Bork Company	553	294
North Devon	333	337
Whitehaven, Cleator, and Egremont	204	—
Kendal and Windermere	115	161
Bedale and Leyburn	106	—

SCOTLAND.—The returns on Scotch lines are:—	1857.	1856.
Caledonian	211,748	210,425
Glasgow and South Western	6,038	5,584
Edinburgh, Perth, and Dundee, and Scot. Central	5,171	4,953
Edinburgh and Glasgow	4,936	4,426
North British	4,726	4,357
Scottish North-Eastern	3,150	3,014
Great North of Scotland	1,118	802
Dundee and Arbroath	547	512

IRELAND.—The Irish returns are:—	1857.	1856.
Great Southern and Western	5,300	6,184
Midland Great Western	3,355	2,816
Dublin and Wicklow	1,545	1,492
Dublin and Drogheda	1,331	1,331
Waterford and Belfast Junction	1,077	917
Belfast and Ballymena	1,076	881
Waterford and Limerick	1,050	904
Londonderry and Enniskillen	625	522
Dundalk and Enniskillen	477	324
Londonderry and Coleraine	266	239
Killarney Junction	250	225
Irish South-Eastern	249	225
Belfast and County Down	248	225
Waterford and Kilkenny	236	251
Cork and Brandon	206	263
Cork, Blackrock, and Passage	173	181
Waterford and Tramore	35	42
Limerick and Foynes	82	—

FOREIGN AND COLONIAL.—The returns on these lines are:—	1857.	1856.
Great Western of Canada	5,301	7,870
Dutch-Belgian	1,357	1,336
Sambre and Meuse	981	1,368
Great Luxembourg	862	297

**RAILWAY STATISTICS.**—The number of railway bills in the United Kingdom deposited this session amounted to 130. Of the number 97 authorities new works, 46 by new companies with a proposed aggregate length of lines of 896; and 51 by existing companies, with proposed extension of lines of 574 miles. The total length of new lines proposed is, therefore, 1470 miles, and there are in addition 40 miles of deviation lines, and 19 projects for enlargement of stations.

The number of persons of all descriptions employed on railways open on Jan. 30, 1856, was, in England and Wales, 84,376; in Scotland, 11,635; in Ireland, 6106; total, 105,117. The list of persons employed is thus divided—327 secretaries and managers, 47 treasurers, 377 engineers, 600 superintendents, 278 storekeepers, 245 cashiers and accountants, 1239 inspectors and timekeepers, 2415 stationmasters, 370 collectors of tickets, 220 draughtsmen, 8158 clerks, 1866 foremen, 3299 engine-drivers, 3382 deputy-drivers and firemen, 3335 guards and breakmen, 2935 switchmen, 244 gatekeepers, 2293 policemen and watchmen, 10,008 porters, 6407 platelayers, 25,217 artificers, 54,696 labourers, and 2832 miscellaneous.

The length of line of railways open at the above date, was, in England and Wales, 6355 miles; Scotland, 1164; Ireland, 986. On English lines there were 2352 stations; on Scottish 387; and on Irish 224. The total length of line authorised to various companies at the same date, but not opened, was, in England and Wales, 3140 miles, of which 663 were then in course of construction; in Scotland 429 miles were so authorised, and 100 miles of it were begun; in Ireland 820, of which 199 were in progress. The number of persons employed on these unfinished and unopened lines was 36,473, making a total railway population for the United Kingdom of 141,600 individuals.

**GREAT INCREASE IN THE EXPORTATION OF STEAM-ENGINES.**—The declared value of steam-engines exported in the course of last month was as much as 76,934l. In the same month last year it was 57,556l.

### THE GREAT COLLIERY CALAMITY.

The shafts at Lund Hill have been opened, and the result of the investigation that has taken place has proved that the closing of the pit was the only means of saving the shafts. The Melton bed has been on fire to a considerable extent; the fire had penetrated a considerable distance into the workings, which, however, were at the latest reports quite free from gas. A consultation of engineers will take place to-day; what will be the result of their deliberations is a question that has already been asked by many anxious hearts, and the solution of which is looked forward to with great intensity of feeling even by those who are not involved in the late fearful calamity. The responsibility which the proprietors of the colliery, by the advice of the engineers, took on themselves of closing the mouth of the pit in order to save the shafts, at the time there were so many of their fellow-men in the burning pit, was most heavy, and one which many of the hardest moral courage would shrink from; subsequent events have proved, however, that their judgment was correct; it was impossible that the lives of the men could be saved, the probability being that long ere the decisive step was adopted the whole of them were suffocated by the deadly gas. The inquest on the bodies of the unfortunate sufferers is adjourned until Monday next, and should their bodies have been taken from the pit, some further information as to the cause of the explosion may then be brought to light. Mr. Coe, it appears, has recommended the fireman, John Warhurst, for allowing the brattices to be so far from the face, and a question has been asked why these were not kept nearer the face. From the examination of Wm. Lodge, it would appear that he worked with a lamp in the face all night, but that his trimmer had a candle. This, the inspector observed, was against rule 21, and, on cross-examination, the witness stated this was done regularly. If this statement be correct, there must have been a constant infraction of this rule; and, we may presume, if it was the case in this instance, that many other regulations, equally as important, have been infringed in a greater or lesser degree. We shall offer no further remarks on this point; it would be both unwise and unfair to draw any conclusions until the enquiry before the coroner is finally terminated.

It was supposed that the appointment of inspectors would, in a great measure, prevent the constant recurrence of many of the accidents that previously had occurred, and which were so justly complained of. At the passing of the Act we stated that the number of inspectors then appointed was too few for the various duties they had to perform; since then their number has been increased, and their salaries augmented, and we cannot but suppose they were all perfectly aware of the responsibility of the arduous task they had undertaken, and accepted it with the full intention of carrying it out in all integrity. We have been led to believe, though we cannot imagine such to be the fact, that the Government Inspector has not been down in the pit since the last explosion in August, 1854; Mr. Morton is generally considered most indefatigable in his exertions, and it does appear to have been a great oversight if he has for so long a period neglected to inspect a pit which was so notoriously known to have a fiery seam as this. It is useless, at present, to speculate upon the causes from which this explosion has occurred; there are some of opinion that owing to the foggy weather there was not a sufficient supply of air to the downcast; there are others who affirm there is a probability that the bed of coal was ignited by the furnace fire; if it arose from either of these circumstances surely there was a necessity for inspection previous to the accident. Some means should have been taken in the one instance to have introduced a fresh current of air in the pit, or, in the other, to see that the furnace was not too near the bed. It may be stated that the fireman and the underground steward had duly inspected the workings, and found all in good order; but it is not in them only the workmen should trust; an inspector has been appointed by Government, and it is his province to see that both the interests of the master, and the safety of the labourers, are attended to, and we should be unwilling to think that such had not been the case in the instance in point. The present regulations, it appears, are stringent enough for all purposes, and if strict discipline were carried out would, no doubt, obviate many accidents; while, however, the inspectors are regarding the details, they should not neglect the most essential particulars—the security of human life: on them devolves a weighty responsibility, and the public expect that they will be found equal to it. If further instructions are required, or fresh rules, let them immediately be promulgated, and at least let us hope that greater care will be taken to prevent such dire calamities as that we are now dilating upon. It is useless to speculate on the cause of the occurrence, or to attach blame to any particular person; it will be time enough to express a decisive opinion when the inquest is terminated, and the pit examined by those competent to form a judgment.

In the meanwhile, it is with great satisfaction that we can allude to the fact that great sympathy has been shown towards the bereaved survivors. A public meeting has been held in Wakefield for the purpose of promoting a subscription for the widows and orphans of the unfortunate deceased; the Mayor, and several of the most influential persons in the borough, have subscribed, and within the last few days, in that town alone, upwards of 1000l. has been contributed. Nor is it here alone that the spirit of philanthropy has been exercised; from Leeds, and several other places, large sums have been collected, so that all apparently has been done to alleviate the wants of the survivors. The proprietors headed the subscription with the sum of 500l.; this generous example has been nobly responded to, several considerable amounts in addition have been subscribed, and it is hoped that the current of benevolence will further promptly assist those who are deprived of their natural protectors by this fatal calamity—one of the most disastrous explosions that has ever occurred in England. How fearful it has been may be judged from the melancholy fact that 188 miners have perished, leaving 89 widows and 190 children without the means of support; surely these unfortunate people merit, under their awful bereavement, all support and sympathy from those who have the means and power to aid them, and, although they can but deplore the cause of their affliction, may materially mitigate its pangs. The late explosion has, however, created such a panic in the district, that 73 persons employed at a colliery not two miles from the scene of the catastrophe have sent in their discharges. It is to be feared that a considerable period will elapse before confidence is perfectly restored, and every precaution appears to have been taken since the accident took place; it is, however, to be regretted that any laxity should have occurred previously.

Since writing the above, we learn that the contemplated conference of the engineers who have the management of the pit will not take place to-day, as the slowness with which the water is at present rising renders it impossible for any immediate steps to be taken. The height to which it is considered necessary for the water to rise in the pit before the fire is totally extinguished is 30 feet; at present it has reached but little more than half this depth.

**ACCIDENTS FROM EXPLOSIONS IN COAL MINES.**—May I be permitted, through the medium of your columns, to make known a plan that will, I have every reason to believe, tend in some degree to prevent those deplorable accidents and loss of life of which we have had such a fearful example within the last few days? I would suggest that the "Davy lamp," with certain modifications, should be its own alarmist, which can be accomplished by the following arrangement:—It is an established fact, that wherever the usual "Davy" is within the influence of the explosive gas, the temperature of its interior is very considerably raised—at times, so much so, that the exterior gauze is brought almost to a red heat. This being the case, I would, in the upper part of the lamp (and inside), have a metal bar that would at once melt at this increased temperature (and not before); the melting of this bar should act on an arrangement that would cause the free escape of compressed air, or other gas, contained in a reservoir attached to the lamp, which escape should act as a powerful whistle (such as the railway whistle), the sound of which can be heard at no little distance. These apparatus can be easily placed at different parts of the mine, wherever there may be any probability of an escape of the explosive gas, and so give timely warning to all within the range of sound; at the same time a jet of water may be made to extinguish the lamp. I have submitted my plans to one of the Government Inspectors of mines, and they have met with his approval; and I trust that they may be the means of saving life and property.—JOHN H. B. TAWAITE.

**THE CYMMER COLLIERY EXPLOSION.**—Jabez Thomas, Rowland Rowlands, and Morgan Rowlands, were tried at Swansea yesterday, charged with the wilful murder of William Thomas, Samuel Edmonds, and another, on July 15. It will be recollected that an explosion took place at the above colliery on the day in question, by which 114 persons were unfortunately killed. The prisoner Jabez Thomas was manager of the pit, and the other prisoners were employed in the superintendence of it, and the question appeared to be whether the lamentable accident had arisen in consequence of the neglect of proper precautions by the prisoners. The jury returned a verdict of "Acquittal."

**BOILER EXPLOSION NEAR OLDHAM.—FIVE LIVES LOST.**—On Thursday one of the boilers burst at Providence Mills, Lees, by which five men were killed and a sixth, who was near the door of the boiler-house at the moment of the explosion, was severely scalded and badly cut. The windows of the mills were broken, and several of the reeters were scalded; one of them, severely. A portion of the boiler was carried to the top of the mill, and other pieces were found from 30 to 50 yards from the spot. A multitubular boiler was injured and shifted from its bed, but not otherwise disturbed.

At United Mines (Gw.), J. Darlington fell down shaft, and was killed. At East Wheel Rose, John May fell down shaft, and was killed.



Messrs. Powell and Cooke have forwarded us the following remarks upon the business of the week:

The market during the week has been more active than of late, and probably as the spring advances and the days become longer, which is so essential to surface operations, more particularly for dressing ores, thereby increasing returns and profits, a more active business may be fairly anticipated, and we would suggest the present as a favourable opportunity for purchasing into some of the best dividend and progressive mines; and for the guidance of parties who are not acquainted with the merits of the different mines in the list, we will enumerate the following as offering good chances of success. There would not be space to enter into particulars relative to the operations at the different mines mentioned below; suffice it to say, they have been selected with care. Some of them have been mentioned by us before, and have advanced considerably in price, according to prediction. We will first name those in the Dividend List which pay from 15 to 20 per cent. on their present market value, and bid fair to continue those rates for a long period. West Basset, Far Consoles, Fowey Consoles, Alfred Consoles, Wheal Wrey, South Caradon, South Wheal Francis, Bodford United. The following are making monthly profits, and some of them will resume the payment of dividends at the next general meeting:—West Caradon, Drake Walls, Great South Tolgus, Granbler and St. Aubyn, Vale of Towy, Wheal Edward, Great Hwas, Fowey United, and East Margaret.

Having named a few dividend and other mines that are being worked profitably, we will instance some that offer great chances of success, arising from the facility in which they are situated, and also from the fact of their being respectably managed.

**GREAT WHEAL ALFRED** has not yet realised our previous anticipations, but we are not discouraged. Only a few months have passed since this mine showed such evident signs of improvement, during which period, we may state, scarcely any mine in Cornwall has opened up so many points of interest. The cutting of the shaft of ore in the 170, which is seen 3 or 4 fms. below the 160, and now worth 80s. to 90s. per fm., is only a work of a short period. When this is arrived at, the value of the mine will be considerably enhanced. The 180, it is anticipated, will also soon come into the ore gone down from the 170; therefore we say that Great Wheal Alfred, at the present market price, 10s. per share (being the best price), offers the best chances for large profit on an outlay than almost any other mine in the list.

**EAST ALFRED CONSOLES** continues to improve. Our former remarks on this mine, and the confidence we placed in it, have not been misplaced. The mine in all continues to improve, and the shares have advanced to 50s., with a firm market.

**WEST GLENVILLE**, situated in the best mining district, at the present low price, is a good speculation. An improvement having taken place in the mine during the week, the shares have been in great demand, at advanced prices. For a comparatively small outlay, fair chances of great profits exist in this adventure.

**NANTES AND PENRHUW** shares have risen from 11s. to 12s. 6s. to 22s., buyers, owing to the improving state of the mine. If the present prospects continue, a further advance will take place. This is a good speculation.

**THE CATHERINE AND JANE CONSOLES** at par to 10s. prem. we consider well worth attention, as large profits are likely to accrue from the sales of magnetic iron ore, a vein of which, about 15 feet wide, and several hundred fathoms in length, has been discovered in the set. This set also contains several very promising lead lodes, on one of which operations are being prosecuted, which bids fair to yield large quantities of ore; a parcel of which, sold this week to Messrs. Eytan and Co., realised 13s. 10s. per ton.

We trust that the foregoing remarks on the prospects and probable chances of profitably investing in the mines mentioned, may result in the same success as hitherto. What that success has been can be ascertained by referring to the columns of this Journal, since the commencement of our weekly articles. Our desire is to bring before the notice of the mining investor such mines as are well known to possess the elements for success—such as locality, together with respectable management, financial, &c. Mining property having become one of the principal means for investment, it becomes the duty of all interested in its welfare to make themselves well acquainted with the merits of the different mines brought before their notice, in order that they may give reliable advice to those who may seek it of them. This done, and acted up to, we have no doubt the public will resort to this class of investment, to a greater extent than they have hitherto done.

Mr. Lelean communicates the following:—

The Mining Market, during the week, has been exceedingly dull, and most of the dividend mines have experienced a decline, some from natural causes, and others from a preponderance of sellers. The exceptions have been few, and are as follows:—Botalack from 190 to 220; Margaret, 65 to 67½; Providence, 87½ to 92½. West Basset, Far Consoles, Carnyorth, East Margaret, Trelyn, Great Hwas, Herward, Lady Bertha (should there not be any Chancery suit?), Lelant Consoles, Molland, Oola, South Cudra, Stray Park, Swanpool, Camborne Vean, West Fowey, Margery, Lant, and Wrey, are all good investments. The accounts from Trelyn represent the mine as looking very well; Margery has improved; Camborne Vean is spoken highly of. Lelant Consoles shares are enquired after. Edward, South Crinnis, and South Cudra have greatly improved during the last month, as has also Ding Dong, for which a new pumping-engine will be required. Spearne Consoles and Granbler and St. Aubyn are both looking much better. Speculative mines, such as Bell and Lanarth, East Basset, Boiling Well, Pendron Consoles, Charlotte, and Gaskus are all worth attention, at low prices, whilst East Providence, a new mine, adjoining Fowey, is also worth notice. This notice is intended to consider the advance in dividends. It should be remembered that four years' purchase is quite enough to give for shares in the mines, until the price of that metal rests upon a firmer basis than at present. Lelant Consoles, Great Hwas, East Margaret, Great Vor, Great Busy, South Carn Brea, Edward, West Frances, Buller and Basset United, North Frances, South Buller and West Penstruthal, Old Tolgus United, West Stray Park, South Gorland, and Carnearns are all good to purchase, and should be held firmly for considerably improved prices, each of these bid fair to prove prices during the current year. The best paying mines to invest in at present prices, yielding from 10 to 15 per cent. per share, are:—Botalack, 190 to 220; Margaret, 65 to 67½; Providence, 87½ to 92½; West Basset, Far Consoles, Carnyorth, Buller and Basset United, North Frances, South Buller and West Penstruthal, Old Tolgus United, West Stray Park, South Gorland, and Carnearns are all good to purchase, and should be held firmly for considerably improved prices, each of these bid fair to prove prices during the current year. The best paying mines to invest in at present prices, yielding from 10 to 15 per cent. per share, are:—Botalack, 190 to 220; Margaret, 65 to 67½; Providence, 87½ to 92½; West Basset, Far Consoles, Carnyorth, Buller and Basset United, North Frances, South Buller and West Penstruthal, Old Tolgus United, West Stray Park, South Gorland, and Carnearns are all good to purchase, and should be held firmly for considerably improved prices, each of these bid fair to prove prices during the current year.

Messrs. Treddinick and Co., in their "Subscription Circular," remark:—

"The great advance in the price of tin enabled many mines to pay increased dividends—in fact, at Margaret, Reeth, Kitty, Ding Dong, Boscan, Providence, Owles, Great Work, St. Ives Consoles, and numerous other mines, thousands of fathoms of ground can now be wrought at a profit, which two years ago were deemed worthless. The shareholders require more tin, and are determined to encourage tin mining by paying a greater price for the ore; thus numerous mines are started, and their object in a few months will be accomplished, when the price will drop as rapidly as it has risen. At the commencement of this year, Margaret shares stood at 40s., the price now is 66 to 68; Reeth stood at 6s. against 27½; Kitty 14 against 19½ to 20; Botalack 210 against 320; Boscan 85 against 105 to 110; Drake Walls 1½ against 3½; Trelyn 12½ to 15 against 18 to 20. We therefore deem it necessary to caution the public against the certainty of long continuance of present dividends, whilst the increased value of shares has in many instances more than anticipated the advance in dividends. It should be remembered that four years' purchase is quite enough to give for shares in the mines, until the price of that metal rests upon a firmer basis than at present. Lelant Consoles, Great Hwas, East Margaret, Great Vor, Great Busy, South Carn Brea, Edward, West Frances, Buller and Basset United, North Frances, South Buller and West Penstruthal, Old Tolgus United, West Stray Park, South Gorland, and Carnearns are all good to purchase, and should be held firmly for considerably improved prices, each of these bid fair to prove prices during the current year. The best paying mines to invest in at present prices, yielding from 10 to 15 per cent. per share, are:—Botalack, 190 to 220; Margaret, 65 to 67½; Providence, 87½ to 92½; West Basset, Far Consoles, Carnyorth, Buller and Basset United, North Frances, South Buller and West Penstruthal, Old Tolgus United, West Stray Park, South Gorland, and Carnearns are all good to purchase, and should be held firmly for considerably improved prices, each of these bid fair to prove prices during the current year. The best paying mines to invest in at present prices, yielding from 10 to 15 per cent. per share, are:—Botalack, 190 to 220; Margaret, 65 to 67½; Providence, 87½ to 92½; West Basset, Far Consoles, Carnyorth, Buller and Basset United, North Frances, South Buller and West Penstruthal, Old Tolgus United, West Stray Park, South Gorland, and Carnearns are all good to purchase, and should be held firmly for considerably improved prices, each of these bid fair to prove prices during the current year.

Mr. John Batters has furnished the following remarks on the Commercial and Mining business of the week, ending Friday night:—

Monday and Tuesday witnessed buoyant markets in shares and stocks. On the adverse vote on Cobden's motion, on Tuesday night, a fall of 1 per cent. took place in the Funds, and in shares from ½ to 1 per cent. on Wednesday morning. This unfavourable political movement, coupled with the settling-day in Consoles, which had been expected to produce a much more serious effect, especially after the late considerable advance in the price of tin, which had been recovered from the previous day, and closed at the highest point, with a strong upward tendency. The favourable operating influences are, easier money, indicating lower rates, continental exchanges more favourable to our country, and less demand for silver for export to India and China. The public continue steadily to invest, and sales are unimportant. Thus, notwithstanding the late advance in prices, and the uncertain position of the Government, we still think that the indications are for a further improvement. French 3 per cent. Rentes have advanced about 3 per cent. in the week, and Paris and Lyons 2½ per share, and Northern of France 2½ per share, and the prices are maintained at the close, to-day (Friday), our markets have been unfavourably influenced, and prices generally are lower. The announcement of a general election has had a dampening influence. Consoles close—for money, 93½ to 95½; for April account, 93½ to 94. A very animated business has been done in Turkish 6 per cent. stocks, and also in Mexican, which have been the leading features of the foreign stock market, the former having advanced fully 2½ per cent., and Mexican 1½ per cent. Mexicans have risen on the rumour that America is about to lend them from three to five millions sterling, part of which it is thought will be appropriated towards the liquidation of the claims of the bondholders. New Turkish 4 per cent., 101½ to 103½; Old Turkish 6 per cent., 96½ to 97.

In Railways a large business has been done, and all the leading lines have advanced. Birmingham, Midland, Leeds, Eastern Counties, and Dover have been in large request. Caledonian has risen 4 per cent., or 2½ per share. Good as the returns of our leading lines were in 1856, up to the present in 1857 a continuous and steady improvement is manifested. Railways are generally lower to-day (Friday), but we cannot help thinking that the depression is merely of a temporary character. Birmingham, 105½ to 107½; Great Western, 68½ to 69½; South-Western, 52½ to 53½; Midland, 82½ to 83½; Great Northern, 102 to 102½; Caledonian, 35 to 35½; Dover, 22 11-16 to 22 13-16; York and North, 31½ to 31½; Berwick, 21½ to 21½; Eastern Counties, 10½ to 11; Luxembourg, 6½ to 6½; Northern of France, 30½ to 30; Paris and Lyons, 57½ to 58; Eastern Bengal, 3-16 to 5-16 pm.; Ceylon, 1½ to 1½; Calcutta and South-Eastern, par to ½ pm.

Bank shares have been more enquired after, and in some instances an advance has been obtained, especially in Ottoman and Egypt Banks, both of which have advanced about ½ per cent., in anticipation of favourable accounts at their respective meetings, which take place this month.

Omnia shares continue in favour, and the price is well maintained.

In Foreign Mines we have no change to notice, with the exception of United Mexican shares, which have advanced ½ per cent.

In British Mines a fair amount of business has been transacted during the week.

The leading points in the construction of the National Bank of Turkey have been transpired. The capital is to be nominally 10,000,000, of which only about 2,000,000, will probably be called up. Its note circulation will be limited to 15,000,000, with a reserve of 3,000,000. In gold. The shares will be to bearer. This is an important point, as it at once limits the liability of shareholders to the amount which has been paid, and no more. The first call will be limited to 5s. per share, beyond which is expected no further amount will be required. The business of the bank will be regulated on the principles of British banking. Great interest is attached to this undertaking, and there is every probability of the shares being rapidly subscribed. The formation of the bank will be beneficial to the interests of the holders of Turkish bonds, as the whole of the business of the Government will be conducted by the company.

## MINING NOTABILLIA.

(EXTRACTS FROM OUR CORRESPONDENCE.)

**UNITED MINES.**—I read with the deepest interest your Journal, conducted as it is, in all its departments, with so much talent; and men of capital are deeply indebted to you for so faithfully presenting the state of mining property to their consideration. There is an old set, the United Mines, which I think has not attracted the attention it is late great improvement deserves. The sales from Jan. 23 to Feb. 26 have exceeded those of all other mines, except Devon Great Consols:—

Jan. 23, 743 tons of copper ore.....	£148 1 6
Feb. 23, 208 " " " " " " " " " "	1585 6 6
Feb. 25, 756 " " " " " " " " " "	4765 5 6=£11,788 13 6

It is expected to show a profit in the two months' working of nearly 4000l. These shares are held principally in Cornwall, and I believe nearly one-half the mine by the members of one family.

**GREAT WHEAL BUSY UNITED MINES.**—The reopening of these important mines is progressing favourably under the able experience and prudent management of Capt. Pascoe. Week after week, as the water sinks, the riches of the mine are disclosed and developed. "The water (so Capt. Pascoe writes) is now out of the 40, and none is flowing in from the western mines: we are working 2½ ft. every 24 hours. We shall now speedily fix the plunger or force-lift in Harvey's engine shaft, 27 fms. below the adit level. We have discovered a lode of copper ore, 2 ft. wide, in the back of the 40, at old Wheal Hodge shaft. We have 19 pitches working below the adit level, and shall have many more to let above the 40 in a few days. The prices vary from 6s. to 13s. in 11. We have also discovered a good lode of tin ore—in short, our mine improves greatly as we go down."

**ST. JUST MINING DISTRICT.**—Our readers will perceive, from an advertisement in our present Number, that a map of this important district is about to be published by Mr. R. Symons, of Truro. Mr. Symons has already published several maps, which have been found very useful, by our mining friends, for the information they convey as to the relative position of the mines, the courses of the lodes, &c.; and we hope he will receive the hearty support of the landowners, adventurers, agents, brokers, &c., for whose use they are prepared. We think he deserves encouragement, as we are sure such a mass of information as the maps contain must have occupied considerable time, and involved much expense in its collection.

**WREY CONSOLS.**—This mine has recently been opened, and is situated about half a mile east of Wheal Emma. Capt. P. Hawke, of the Queen on the Dart Mine, states that he has inspected the ground on the surface, and the character of the stratum underneath as far as already explored. The operations in progress are a constant pit, only a few feet from surface, on the back of a very masterly champion copper lode, of great width, composed chiefly of gossan and quartz, impregnated with spots of mudiic, blende, lead, and copper ore—features of no ordinary character for a mineral production, the kind also being of a very congenial description, bold outcroppings of good results. Capt. James Carpenter, of Tavistock, has also carefully surveyed the property, and reports that the facilities for working to an advantage are very good, as they can drive on the course of the lode at a trifling expense, and get into deep ground, from 50 to 60 fms., in about 100 fms. driving. The position taken up to commence operations is suitably selected, being about 50 fms. east of a very large cross-course, and so situated as to bring the water on a powerful wheel at the least possible expense practicable. Capt. Thos. Feazey, of Buckfastleigh, fully confirms the above reports.

**DEVON AND CORNWALL UNITED.**—It is reported that there is a great improvement in the middle level, about between No. 1 and 2 winzes.

**AT NANTES AND PENRHUW**, a considerable improvement has taken place, the lode in the 10 being worth 1 ton of lead ore per fm.; and the 20 is also improving, already saving work. The adit level was expected to be communicated to Bluch Gwyn shaft this week (at 45 fathoms deep), when the stops of three mines would become available, which will enable the returns to be at once greatly increased, the costs remaining about the same, as some heavy dead work will now be stopped. This adit has been brought up for about ¾ of a mile in length, and notwithstanding this and other heavy work, the returns have been very nearly met the costs, so that good profits may be expected to be now immediately made. This week 25 tons of ore, for one month, were sold to Messrs. Walker, Parker, and Co., at 14s. 14s. per ton (367½ lbs.). The company is now under the Limited Liability Act, in 5000 shares, of 2½ lbs. each, about 2½ being paid. The mines are in the rich district of Cardiganshire.

We have been furnished with the following extract from the prospectus of the GLASLBY LEAD AND COPPER MINE, intended to be limited, in 1000 shares, of 1s. each, deposit 10s. Offices, 10, Austinfriths, London, E.C. This mine is adjoining to, and in the immediate vicinity of, Dyliff, Dyfnwyl, Cafarth, Bugeil, Llyn, Rhoswyddol, and other rich mines. This set is held at a royalty of 1-16th, for a term of 21 years, and extends 1000 fathoms in length, and is about the same in breadth. The ground is similar to that which has produced abundance of lead in the adjoining mines. A striking and important feature in this set is the Glaslby Pool, which is of great depth, and exceeds in circumference. Within the area of this pool several of the lodes intersect, and so highly mineralised is the water, that it has been impossible to stock it with fish—a fact unprecedented in this country. The advantages possessed by this mine are:—1. An unexpired term of 21 years. 2. Low dues (1-16th). 3. An extensive set. 4. No surface damages. 5. Capability for working to the depth of 100 to 140 fathoms from surface without any mechanical power. 6. That at one-half of that depth the adjoining mines have returned large profits, or become of great value. 7. Abundant water-power for dressing, and for pumping, if required. 8. A proved district. And, last, a lode laid open, carrying a north and south direction. A shaft, which is midway between the eastern and western boundary, has been sunk to the depth of 38 fms. below the surface, and from surface, without the aid of a steam-engine, the mine being so far drained by the surrounding mines, that the water has been easily kept by bores; but at this point the shaft fell in with the lode, and the water became too powerful to continue operations below the 16 without machinery. The lode at the adit level is 24 fms. south of the shaft, and that level is driven on the lode 27 west of the shaft. The lode in the end is poor at present, but several tons of jack (zinc ore) have been and probably will be got from the back of this level. In the bottom of the level there are two pitches, yielding on an average 2½ cwt. of lead per fm., but it does not appear to continue down so good, and the 16 is driven from the surface, and is not thus far laid open any tribute ground. The 16 is extended 18 fms. west of the shaft; the lode is from 2 to 5 ft. wide, and composed of spar, some mudiic, jack, and a little copper—more resembling a copper lode than at the adit, where it is principally floukan and jack. The water being kept only to the 16, I could not examine the 26 and 38, but I understand that very little is done more than the lode cut through, where it is said to be towards 10 ft. wide, and from the character of the stuff in the bore, the bearing of this lode is about 2 S. of W., under a dip of nearly 4 ft. in 1 fm.; and at a depth of 70 fms. below adit it forms a junction with an interesting point to reach. The stratum is all that can be desired, and I think it only requires to go a little deeper to make valuable discoveries. To prove this properly, a 36-in. cylinder engine should be erected, and the shaft sunk below the 38 on the course of lode; and as there are other lodes to the south, the backs of which have been worked away for tin, a cross-cut should be extended towards them as fast as possible. After this promising line, upon the money we have sunk 3 fms.; it is about 4 ft. wide, and it is likely there will be the proceeds of from 50 to 60 tons of jack, providing the adit level continues to lay open tribute ground, which I see no reason to doubt.

**TREWANE UNITED.**—It is expected that the engine-shaft will be completed in about two months; the lode in the bottom is producing silver-lead ore, estimated to be worth from 25s. to 30s. per fathom.

**EAST WHEAL CLIFFORD** (reports Capt. W. H. Reynolds, of Redruth), is the western part of Basset Gwyn United Mine, and the principal operations are on a continuation of the rich lode of Wheal Clifford, which mine lies about 700 fms. to the west of it. The set has about 250 fms. on the course of the lodes, and 500 fms. in a north and south direction. A shaft, which is midway between the eastern and western boundary, has been sunk to the depth of 38 fms. below the surface, and from surface, without the aid of a steam-engine, the mine being so far drained by the surrounding mines, that the water has been easily kept by bores; but at this point the shaft fell in with the lode, and the water became too powerful to continue operations below the 16 without machinery. The lode at the adit level is 24 fms. south of the shaft, and that level is driven on the lode 27 west of the shaft. The lode in the end is poor at present, but several tons of jack (zinc ore) have been and probably will be got from the back of this level. In the bottom of the level there are two pitches, yielding on an average 2½ cwt. of lead per fm., but it does not appear to continue down so good, and the 16 is driven from the surface, and is not thus far laid open any tribute ground. The 16 is extended 18 fms. west of the shaft; the lode is from 2 to 5 ft. wide, and composed of spar, some mudiic, jack, and a little copper—more resembling a copper lode than at the adit, where it is principally floukan and jack. The water being kept only to the 16, I could not examine the 26 and 38, but I understand that very little is done more than the lode cut through, where it is said to be towards 10 ft. wide, and from the character of the stuff in the bore, the bearing of this lode is about 2 S. of W., under a dip of nearly 4 ft. in 1 fm.; and at a depth of 70 fms. below adit it forms a junction with an interesting point to reach. The stratum is all that can be desired, and I think it only requires to go a little deeper to make valuable discoveries. To prove this properly, a 36-in. cylinder engine should be erected, and the shaft sunk below the 38 on the course of lode; and as there are other lodes to the south, the backs of which have been worked away for tin, a cross-cut should be extended towards them as fast as possible. After this promising line, upon the money we have sunk 3 fms.; it is about 4 ft. wide, and it is likely there will be the proceeds of from 50 to 60 tons of jack, providing the adit level continues to lay open tribute ground, which I see no reason to doubt.

**FROM MOUNT'S BAY CONSOLS**, Capt. J. Richards (March 5) reports:—In the month ending Feb. 21, the north cross-cut, at the 45, has been driven 1 fm. 3 in.; the back ground in this end was working on slowly. The north cross-cut, at the 25, has been driven 3 fms. 0 in. 9 in.; and an intersecting cross-course; the ground beyond is composed of capel, slate, and mudiic, with carbonate of copper, very favourable for mineral. The 35 has been driven 1 fm. 5 ft. 3 in.; those men have been otherwise engaged part of the month; the ground is at present more favourable for driving. Our last sale of tinstuff produced 87½ lbs. 4d. The tribute pitch in the 35 has not turned out so well as expected. The pitches in the 25 are much as before. We have had our surface men occasionally employed costaining in our north ground, and in a pit about 45 fms. east of the north cross-cut have found a very promising lode, upon the money we have sunk 3 fms.; it is about 4 ft. wide, and has all the characteristics of the Tolvadden lode at a similar depth. We are having pits sunk further west, to trace its course on to the line of our cross-cut, which is about 250 fathoms west of Tolvadden engine-shaft, where they have the lode producing excellent black and grey ore, at 26 fms. from surface.

**FROM CLARA SILVER-LEAD MINE**, Capt. Trovethan, jun. (March 4), reports:—The slope in the back of the 20, east of the rise, is just as last reported, the lode being about 4 feet wide in this place, and yielding 15 cwt. of lead ore per fathom. Very little has been done underground this last week, in consequence of a breakage with the rods, which has hindered the men for some time from going down, but hope the water will be in fork by to-morrow morning.

**CATHERINE AND JANE CONSOLS** (Portmadoc).—The Blaina Iron Company, Newport, after having tested two cargoes of magnetic iron ore from the above mine, have ordered a further quantity of 500 tons: 230 tons have also been sent, per order, to the Tredegar Iron Company, and several applications have been made for sample parcels from various parts of the kingdom.

**WHEAL CLARA.**—In Vice-Chancellor Wood's Court, on Thursday, a motion for an injunction was made to restrain Mr. Rowlands, the landlord, from proceeding in an action of ejectment brought by him to recover the possession of this mine, and standing for trial at Cardigan next week; and an order was made to restrain Mr. Rowlands from executing the effect of this will be to stop proceedings against the hearing of the Chancery suit, the object of which is to compel Mr. Rowlands to grant a lease of the mine under the terms of a take-note, upon the faith whereof the present company have been working the mine. Mr. Bolt and Mr. Eddis were counsel, and Messrs. Hancock and Sharp, solicitors on behalf of the company; and Mr. Pigot was counsel, and Mr. Atwood, solicitor for Mr. Rowlands.

**DUTY ON GOLD IN NEW SOUTH WALES.**—Recent advices bring the news that a bill is now before the Legislature of New South Wales for levying a duty upon gold at the Customs, previous to exportation from New South Wales, 2s. 6d. per ounce troy, and at the Royal Mint at Sydney 2s. 4d. per ounce troy, of standard fine-gold, as declared after the said gold shall have been assayed and brought to the standard of 22 carats fine at the said mint. Gold which has paid duty at the Mint will be passed free at the Customs. Gold, other than the produce of New South Wales, is not liable to duty.

## Mining Correspondence.

## BRITISH MINES.

**ALFRED CONSOLS.**—M. White, T. Trelease, T. Hosking, March 2: There is no change to notice in the lode east and west of Field's engine-shaft, in the 150. The lode in the 140, east of this shaft, is worth for copper ore 12s. per fm. The lode in the 130, west of this shaft, is without change since last report. In the 120 west still driving, south of Davy's engine-shaft, the ground is still wet, which indicates that the main lode is still south of the end. In the 100, east of this shaft, none of the lode has been broken for the last week, as the men have been driving by it; reported last week 70s. per fm. We have just commenced to drive the 100 east of this shaft, on the south lode. The north lode, in the 90, east of this shaft, is worth for copper ore 70s. per fm.; this lode in the rise, over this level, is worth for copper ore 60s. to 70s. per fm. The south lode, in the 80, west of ladder winze, is worth for copper ore 20s. per fm. The tribute department looks well.

**BALLYVIRGIN.**—R. W. Smith, Feb. 21: The lode in the north end is poor. The branch that split off from the main part of the lode has joined the lode in the sole of the level, and is laying quite flat. The lode will not yield more than 10 cwt. of copper ore per fm. The slope in the south level is also looking poor, and we have a great increase of water. I shall suspend this slope to-day; the lode in the bottom will yield about 15 cwt. of copper ore per fm. We have not yet cut through the lode in the west cross-cut, in consequence of its underlying so very quick: the lode is looking stronger here than it did; in the south level, where we drove past it, the lode is about 10 in. wide, composed of sulphur, or mudiic, with good spots of copper ore, and terminated through it. The masons have got the foundation of the engine-house upon a level with the surface, and the weather continues favourable for building. I have not yet been able to procure a vessel to convey our ore.

**BEDFORD CONSOLS.**—J. Hodge, March 3: The ground in the shallow adit is at present favourable, and the men are making fair progress; the lode is at present about 3 ft. wide, a good ore lode for about half-way to the end, and from that point to the back we have generally mudiic, with stones of ore now and then, altogether a very kindly lode. I have every confidence that it will in a day or two further improve. You will see by only having ore half-way to back of end, that we are only just going in over the top part of a shoot. This has been the case for the last 10 fms.; sometimes the ore has appeared nearly up and down the end, and other times but very little, thus showing that nothing but a deeper point is required to lay open a valuable mine. We are getting on with clearing up the old workings as fast as the nature of the work will admit; we are down about 4 fms. I hope in the next week to see the bottom, when we shall be able to put some men to rise against, and soon obtain a ventilation; after this is done we shall no doubt be able to sink several fathoms under the adit, and prove the ore gone down to a small extent, this will be a great guide for our future operations.

**BEDFORD UNITED.**—J. Phillips, March 5: The lode in the 115 fm. level west is 4 ft. wide, and will produce 2½ tons of ore per fm. The lode in Osborne's winze, sinking in the bottom of this level east, will produce 5 tons of ore per fm. The different stops, and other parts of the mine, are without alteration since last report.

**BOILING WELL.**—John Delbridge, Feb. 28: The lode in the 60 east is 20 in. to 2 ft. wide, yielding some good stones of copper ore; still we think there is more lode to the north, for which we purpose cross-cutting to meet with it. In the 50 east we are cross-cutting south to meet the south branch; we expect 2 fms. more will cut the lode. In the bottom of the lode is 2½ ft. wide, yielding 1½ ton of ore per fm. In the 20 east, on south lode, the lode is 1½ ft. wide, yielding ½ ton of ore per fm. In the 20 east, on the same lode, the lode is 20 in. wide, yielding ½ ton of ore per fm. In the 20 east, on the same lode, the lode is 20 in. wide, yielding ½ ton of ore per fm. In the 10 east, we are driving a cross-cut in the 30, west of King's, to try to cut the north lode; we expect 3 fms. will meet the lode. We are driving a cross-cut 22 fms. west of King's to try to cut the north lode; we hope 2 fms. more will cut the lode at this point. In the 20 cross-cut, south of Austin's no lode is cut as yet. This morning some good good stones of copper ore have been met with in the cross-cut dipping towards the lode, the ground has a good appearance, and the ore taken from the branches seems favourable for ore being in the lode. Our machinery throughout the mine seems to be working well. Our tribute department is without change to notice.

**BOLKOWE.**—W. Roberts, March 3: Nothing new since last reported.

**BRYNAILL.**—J. Roach, March 5: The ground in the cross-cut driving south, to intersect Brvnail lode, is without any material alteration since last reported. I hope to see the lode in a few days. The stops east of No. 2 winze, in back of the 20, continue to produce about the usual quantity of ore. The slope in the bottom of the shallow level still produces good stones and deposits of ore. The pitch in back of the 10 east of the rise, is just the same as described last week. The men can earn wages at 6s. per ton. We have about 23 tons of ore dressed, and some undressed—say, 2½ tons. I hope, in a few days, to complete the delivery of the parcel of ore at Newtown.

**BULLER AND BASSET UNITED.**—G. Reynolds, Feb. 28: The lode in the engine-shaft is still 5 feet wide, producing rocks of mudiic sprigged with copper ore, still improving in its appearance. The lode in the end, going east at the flat rod shaft, is much the same as last reported.

**G. Reynolds, March 1:** The shaftmen are still sinking on a large and promising lode, composed of gossan and spar, sprigged throughout with mudiic and iron, and some rich deposits of black ore has been found in the lode; the shaftmen sunk 2 fms. 5 feet last month.

**BUTTERDON.**—Thos. Grenfell, March 5: We have extended northward from the cross-cut about 1 fm. 1 ft.; the lode is from 20 in. to 2 ft. wide, in floor-apart, particles of yellow copper and lead ore, with occasional good prills of lead, quite saving work in bulk. On either wall we meet with capel patches, faced with prill and decomposed felspar, in appearance more desirable than at any former time. As we extend this level we shall make more room, which will enable us to save the work more clean of attle than at present.

**CARBORNE CONSOLS.**—W. Roberts, March 3: In the 35 west, on the caunter, the lode continues 1½ ft. wide, producing stones of ore. The 20 west, on Wheal Gons lode, produces 1 ton of ore per fm.

**CARVANNALL.**—W. Roberts, March 3: In the 118 west the lode is 2 feet wide, producing ½ ton of ore per fm. The other bargains are without alteration.

**CATHERINE AND JANE CONSOLS.**—J. Treweek, March 5: The lode in the deep adit end is just the same as when last reported—looking well; no lode taken down this week. I have put six men in No. 2 winze, they have been busily engaged fixing casing boards, hanging tackle, &c. have to-day examined the bottom of the winze, which is the engine-shaft, and the lode is 10 to 12 cwt. of lead per fm. There is a piece of ground south-east of the winze, when convenient to take it away, that will produce full 20 cwt. of lead per fm., and is looking much better than I expected to find it.

**CLIJAH AND WENTWORTH.**—J. Vivian, G. Glasen, Feb. 28: The ground a Walter's engine-shaft is more favourable for sinking than it has been—shaft down 7 fms. below the 70. In the 60 cross-cut, driving south-east of engine cross-cut, we have intersected a small branch of a lode underlying north; and Julia lode, in the 50 underlying south: we have suspended this cross-cut, and commenced a winze under the 50 at the same point, which will show us if it is necessary to extend the cross-cut still further. No lode intersected in the 60 cross-cut, west of engine cross-cut, yet we calculate to have 6 fms. more to drive to cut it. The 50, driving west of engine cross-cut, on Julia lode, is just the same as when last reported—present not to value. Whitford's Lode. In the 60, driving east of engine cross-cut, the lode is 4 ft. wide, with stones of tin, but much disordered by the elvan course. In the 60, driving west of engine cross-cut, the lode is 6 ft. wide, worth 15s. per fm. for tin. In the 50 west (winze) the lode is 4 ft. wide, worth 10s. per fm. for tin.

**COLLACOMBE.**—S. Mitchell, March 3: During the last month, the 73 fm. level, west of Morris's engine-shaft, has been driven 6 fms. 4 ft. 4 in.; the lode in the present end is of a highly promising character, being full 2 ft. wide, composed of capel, quartz, mudiic, and copper ore. The 62 east of Morris's shaft, has been driven 1 fm. 4 ft. 10 in., there is no alteration in the lode to notice. The rise in the back of the 62 has been put up 5 fms. 4 ft. 6 in.; lode worth 1 ton of rich ore per fm. The winze in the bottom of the 60 has been sunk 4 fms. 4 ft.; the lode is full 4 ft. wide, composed of quartz, prill, and copper ore. Other operations progress well: 169 tons of good quality ore were sampled at Morwellham on Friday last.

**CUBERT UNITED.**—J. Trewin, Feb. 28: The lode in the engine-shaft is 1 ft. wide, composed chiefly of quartz and mudiic, yielding good stones of lead ore. The lode in the 76, south of the sump-winze, is 10 inches wide, containing quartz, prill, &c., producing spots of lead ore. The lode in the winze, in bottom of this level, is 9 in. wide, at present poor for lead; the slopes in back of this level, south of the engine-shaft, are worth 5 c







**FRIDAUX WOOD.**—John Puckey, Feb. 27: The engine-shaft is sunk to the 54, where we have the 1st in the shaft at the 54; it is 3 ft. wide, and at the 52 ft. 3 in. a much larger, and I may say, a kinder for copper than in the level over. We are now entering the 54, and doing other work preparatory to sinking the shaft below, which will occupy six weeks; after this is complete we shall commence to drive in the 54. From the steady appearance of the level we hope to reach the first cross-course about 20 fathoms eastward in three or four months' time, where the tin and copper commences and continues about 25 fms. in length up to another cross-course, and after that the level in the 54 changed its character again from tin to copper ore, and is kindly home to the present end, where we are rising for ventilation. We hope to have 5 tons of tin ore ready for sale again within a fortnight.

**ROSEWARNE AND HERLAND UNITED.**—S. Mitchell, March 4: The level in the 54 is divided, and we are driving on the north part, which is producing a little tin ore, and is kindly home to the present end, where we are rising for ventilation. We hope to have 5 tons of tin ore ready for sale again within a fortnight.

**SILVER BROOK.**—W. Hosking, March 4: I beg to inform you that no alteration has taken place in any of the tubs or engines since sending you my full report for the general meeting, which was held on Feb. 20. The tubs are all working well, and producing large quantities of ore. In my report of Feb. 3, I stated that we had then sold 100 tons of ore to the value of £350, and should sample a similar parcel in a fortnight from that time. I beg to inform you that it has been sampled, and sold, realising £340, and we intend sampling another 100 tons on Saturday next.

**SITHNEY WHEEL BULLER.**—The south shaft, on Schneider's level, has been sunk 4 ft.; the level is 10 ft. 6 in. In the 50, east from south shaft, the level is large, producing work for the stamps of low quality; ground driven 4 ft. In the 50, west from cross-cut, on Schneider's level, the level has for the last few days been a little disordered by cross-branches, it is at present worth 200 per fm.; this level will shortly intersect the cross-course; ground driven 4 ft. 9 in. The cross-cut south from the north level, in the 50, is communicated with the south level. Driving east on the south level has been resumed, where there are very favourable appearances. The cross-cut south from the engine-shaft, in the 50, has been driven 6 ft. 6 in. The shaft east of engine-shaft has been cleared up 5 fms., but in consequence of water being at this level, it cannot be proceeded further with, until the water is let down by clearing the adit, which comes up to it from the eastward. Operations in this quarter will be conducted as economically as possible, consistent with our object—to decide on the right place for an engine-shaft. Westward the north engine-shaft will be sunk directly.

**SORTFIDGE AND BEDFORD.**—T. Treweek, March 5: The cross-cut has been driven 9 fms. south in the 54, but we have not yet intersected the level; the present end is very wet; therefore, I should say we are not far from the level.

**SORTFIDGE CONSOLS.**—J. Richards, March 5: Fair progress is being made in sinking Hitchen's engine-shaft. At Hitchen's shaft, in the 62 east, the level is 2 ft. wide, composed of capel, mudi, quartz, and a little ore. In the 40 east the level is worth 1½ ton of ore per fm. In the 50 cross-cut south the ground is favourable for progress. In the 40 west the level is 18 in. wide, containing gossan, pryan, quartz, and a little black ore. The level in the stope, east and west of Bryant's winze, is worth 2½ tons of ore per fathom. In the 50, south of the 40, the level is 30 west, and west of Edward's rise, the level is worth 2 tons of ore per fm.

**SOUTH BEDFORD CONSOLS.**—J. Phillips, March 5: The level in the 62, east of Red Whim shaft, has undergone a change since last report; in the same level west the level has a little improved, being now worth 2 to 3 tons of ore per fathom. There has been but little done in driving the cross-cut north at Gullet's shaft, owing to the men having been engaged in fixing lift, and doing other necessary work, preparatory for deeper sinking of this shaft. We have nothing new to report in any other part of the mine.

**SOUTH GARGOLL.**—J. Grose, March 5: The 60 south-west, at Daubuz's, is producing moderate work and letting down much water, which is so far relieved the 50 that we have this day cut through, or rather into, the level 1½ ft., which is pretty quick, and yielding fair average work, it is a very kindly end, and we have no doubt our driving on the level from this point. The rise in the back of the 60 is now up to 5 fms., and continues good, leaving good level in end of the rise, so far as we have seen of the new feature in the 20, north from Mitchell's (a leader of lead, from 2 to 3 in. wide), it has the appearance of a dropper coming in obliquely from the south-east, and underlying towards and accompanying the level; it is of a very promising character and producing very good work. We are still engaged cutting the level in the 70, at Daubuz's. The ore sampled to day (about 60 tons) will meet all the cost for the six weeks spent in raising it.

**SOUTH CARN BREA.**—T. Glanville, March 4: The flat-rod shaft is down 10 fms. below the 48; the men are now engaged putting in drawing guides. In the winze sinking below the 48 the level is producing 1 ton of ore per fm. In the deep adit cross-cut the ground still continues soft for driving through.

**SOUTH CRENEL.**—J. Delbridge, E. Chegwinn, Feb. 28: In the flat-rod shaft the men have dropped the lift as deep as the 94; the men are also sending up the old pit from the 94 to the 54; we hope to secure the shaft, and complete to the 94, against the end of the coming week. In the 54, east of the engine-shaft, the level is 10 in. wide, yielding a little copper ore, at present more kindly than for the past six months, although at present not to value. In the 54 west the stope is progressing towards the shaft rapidly. In the 74 west the level is 2½ feet wide, worth ½ ton per fm. In the 74 east the level is 2½ feet wide, containing stones of ore, but not to value. In the 64 east the level is 2½ in. wide, worth 1 ton per fm.; we purpose driving the 64 west in the coming month, by the consent of the committee; the level in this end is 6 in. wide, yielding some ore, but not to value, but for want of air, we cannot work the west part of the mine with that progress we could if properly ventilated; by driving the 64 west 10 fms., we should communicate the 74 to the 64, by a rise above the 74, and the backs will be stopped to a better advantage; we beg to recommend this to your notice. The 64 east, east of Gore's level, is 2½ feet wide, worth 2 tons per fm. In the 44 west, the level is 2½ ft. wide, worth ½ ton per fm. In the 34 west the level is 2 feet wide, unproductive. In the 24 west the level is 2½ feet wide, worth 1½ ton per fm.; we have suspended this end for a few days, to sink a winze from this level to communicate with the 34; the level in the winze is 2 feet wide, yielding 1½ ton per fm. Our tribute throughout the mine is without change to notice.

**SOUTH DEVON CONSOLS.**—J. Cook, March 2: During the past week no great alteration has occurred in the prospects of this mine. The cross-cut in the 56, which is still in hard ground, is being pushed on by every means in our power. In the end driving west in the 56, there is a very kindly level, composed of gossan mixed with copper ore. In the rise, in this level, the level is at present small, and unproductive.

**SOUTH DOLCOATH AND CARNARTHEN CONSOLS.**—W. Roberts, March 3: The 70 and 40 driving west are progressing favourably. The tributers have drawn and are in course of dressing some good ores.

**ST. AUSTELL CONSOLS.**—R. H. Williams, Feb. 28: Downon's engine-shaft is down 6 fms. 3 ft. under the 35. The cross-cut south in the 35 is within a few fathoms of the south level. In the 25 east, on level, nearly through the great cross-course; I hope we shall get clear of this cross in about a fortnight. In the 15 south we have cut a floor of stope level which is turning out some good work for tin. Our tribute department is without alteration of importance. Our stoves in the 25, at Downon's, are much as usual. I will inform you immediately if anything turns up new, which I hope will be shortly.

**TAVY CONSOLS.**—R. Williams, March 4: The bottom of the 36 east to stope by the fathoms, by eight men, at 54. 10s.; this stope is worth 4 tons of ore per fathom. The back of the mine, level, at 54. 10s.; this stope is worth 4 tons of ore per fathom, going up towards the 48, through a large piece of ground. The stope in the back of the 36 west, west of the cross-course, by eight men, at 54. 10s. per fm.; here the level is large, and worth 5 tons of ore per fathom. Four men employed cutting through a piece of level, west of the last stope, up to the end, at 24. per fm.; the level here is ore, but cannot say of what value before it is further laid open. On the completion of the last-named bargain, which will be in a fortnight, the driving of the 36 west will be resumed. The shaftmen are clearing up the shaft in the 40, and in the course of a few days we shall resume the driving of the 40 east under the ore ground in the 36. The prospects of the mine continue to be good. The ore sampled on Friday last was 90 tons.

—R. Williams, March 3: Since my report of yesterday, there is an improvement here. The level in the rise in the back of the 36 west, west of the cross-course, is producing fine stones of ore. This is home against the cross-course, and looks well for this part of the mine. The piece of level further west, where we are cutting it through, has improved also, and matters generally are looking cheering.

**TRELEIGH.**—J. Prince, Feb. 28: Good Fortune level, in the 50, at Carr's, is about 2 ft. wide, containing much mudi, jack, and stones of yellow copper ore. There is a runner of mineralised ground in the vicinity of the shaft, and you are aware that we did not expect to see much ore before we opened on the level a few fathoms, which will be done as soon as we cut the Shanger level at the level. But returning to Good Fortune level, I beg to observe it is large, more regular, and stronger than the level in the 50 than in the 40 cross-cut. In the 40 south we have cut into Shanger level, which is from 18 in. to 2 ft. wide, consisting of quartz with a small quantity of yellow copper ore; we shall open upon it as soon as possible next week. The level in the 40 west is 2½ feet wide, producing stones of good quality ore—the indications are good.

**TREYONE CONSOLS.**—W. Tom, March 3: The mine is still improving. I have driven since my last report about 10 ft. in the north end of the 25, which level is standing, and can be taken down at any moment, when our incline will be completed; the level has increased in that distance, I should say 4 in., I have not broken it through to see, but judge from where a blast has shook it, and I have taken a little down, chiefly all clean ore of a beautiful quality. I am also driving out of the sinking under the 25 north and south, which level is continuing as good as ever, and increasing in size. The cross-cut in the valley is about 10 fms., which is going very speedily, owing to the grey ore level which is cut, which has given great freedom to the working. I feel satisfied that the said level will, in the course of a few fathoms, come in junction with the great mass of east and west levels, and I do not see any doubt but there will be a mass of ore at said junction, independent of the regular ore that I know the levels contain. The incline will soon be in operation, and the floors and all necessary utensils will be ready about the same time, when we shall soon have a good pile of ore ready for sampling. I see the assays of our ore by Mr. Wentworth L. Scott in the Mining Journal of Feb. 26; he may have made an accurate assay, and the ore appears very good, but observe it is large, more regular, and stronger than the level; I am of opinion that it contains much more silver than he describes, my judgment may be wrong, I merely judge from having been accustomed to work on rich silver-lead ore.

**TREYONE UNITED.**—R. Reynolds, March 2: The engine-shaft is now about 6 fms. below the 20. Last Saturday being setting-day the shaft was taken by six men and three labourers, at 20, per fm. With the increase of hands I hope to reach the 30 in about two months.

**TREYVETHA.**—T. Richards, Wm. Rowe, March 3: The 70 is opened south sufficiently for top of plat, and we have to-day commenced cross-cutting west towards the level. In the 60, north from engine-shaft, the level is worth 60 per fm.; the south end is worth 60. per fm. The 50 north is worth 40 per fm. The stope through-out the mine are producing just as usual. We sampled, to-day, two parcels of ore; No. 1, computed 40 tons, and No. 2, 33 tons, to be sold on the 12th inst.

**VALE OF TOWY.**—S. Thomas, T. Harvey, S. Harper, March 3: At Clay's engine-shaft we have completed cutting plat in the 50, and are now driving north and south on the level, which is 5 ft. wide in each end, composed of barytes and kila, mixed with lead, and each end producing 1 ton of lead per fm. In the 40, north of the said shaft, the level is 2½ ft. wide, producing lead, but not sufficient to value. In the same level, south of Field's level, the level is 2½ ft. wide, barytes and gossan. At Bonville's shaft the level in the 40, on north level, is 3 ft. wide, producing 15 cwt. of lead per fm. In the 30 north the level is 30 in. wide, producing about 7 cwt. of lead per fm. In the winze in bottom of said level, the level is 2 ft. wide, producing ½ ton of lead per fm. In the winze in bottom of the said level south the level is 2 ft. wide,

unproductive. In the 20, south of Clay's engine-shaft, on cross level east, no alteration in the past week. In the same level, south of Field's shaft, the level is 3 ft. wide, in the same level, driving east of Bonville's, as last reported, the level is 3 ft. wide, principally kila.

**WEST ALPRED CONSOLS.**—S. Lean, R. Stevens, March 4: The ground at flat rod shaft, sinking below the 85, is favourable. The level in the 85, west of said shaft, is 4 feet wide, composed of mudi, spar, and stones of copper ore. The level at the east end of this level is worth 150 per fm. The level in the 75 west is large, and worth 60 per fm. The stope in the back of this level is worth 150 per fm. The level in the 65, west of No. 1 winze, is 3 ft. wide, and will produce 1½ ton of ore per fm., with every prospect of a further improvement. The stope in the back of this level is worth 150 per fm. The stope in the back of the same level, east of No. 1 winze, is worth 150 per fm. The ground in the 75 cross-cut, south of engine-shaft, is a little more favourable; the end is letting out water, an indication that we are approaching the level.

**WEST BARSET.**—W. Roberts, March 3: On the north level, in the winze sinking under the 104 ft. level, the level is 4 ft. wide, producing 1½ ton of ore per fm. The rise in the back of the 104 is nearly communicated with the winze, under the 94; in each the level is 3 ft. wide, worth 1 ton per fm. On the counter level, in the 75 east the level is 2 ft. wide, yielding 1½ ton per fm. On the engine level, in the 52 west the level continues 4 ft. wide, with a leader on the south side, producing about 2 tons per fathom. The stope and pillars are looking well.

**WEST COLLA-COMBE.**—H. R. Adde, March 3: The eastern engine-shaft is sunk to the depth of 8 fms. below the 30, at which point we have intersected the level, which is upwards of 3 ft. wide, containing a very fine capel, quartz, mudi, pryan, and occasional stones of lead, copper, and iron. The level cannot be seen, but the level is alteration to notice in the level in the 20, driving east or west of the eastern engine-shaft, since last reported on. All other work is going on satisfactorily.

**WEST SHARP TOR.**—W. Richards, March 2: The cutting of plat at the new shaft is completed, and driving of cross-cut north therefrom, and sinking below the cross-cut, is therefore resumed. No change of importance has taken place in the ground in any other point of operation. The water has now become so quick for the present pitwork in Morris's engine-shaft, that it is absolutely necessary for us to look out for 50 fms. of 12-in. plunger-lift complete as quickly as possible.

**WEST POWEY CONSOLS.**—J. Puckey, Feb. 27: This mine looks exceedingly promising. Deeble's level in the 90 ft. level is ore and kindly, and improved from the level over. Protection level, in the 90 ft. west, will produce 6 tons of ore per fm. worth 700 per fm., this end is about 5 fms. west of the shaft. The 90 and east has been driven 4 fms., and will produce about 21 tons per fm., same quality. The shaft is set to sink from the 90 to the 100, about 12 fms. on course of level; this shaft is sinking 12 ft. long, and down about 6 ft. below the level by the side of the level; the wall of the level, with other favourable indications, induces us to compute 10 tons of high price ore to every 6 ft. in depth. The shaft has already drained the 90, which is a favourable characteristic. In the bottom of the 80, about 16 fms. before the 90 end westward, we have begun to sink a winze, where the level will produce about 4 tons of ore per fm. In the 80 end west the level is very large, composed of peach, mudi, copper ore, tin ore, iron ore, alex., &c., but not of much value. The tin level in the 100, from Par Consols, is 3 fms. wide, and will produce about 21 tons per fm., same quality. The shaft is set to sink from the 90 to the 100, about 12 fms. on course of level; this shaft is sinking 12 ft. long, and down about 6 ft. below the level by the side of the level; the wall of the level, with other favourable indications, induces us to compute 10 tons of high price ore to every 6 ft. in depth. The shaft has already drained the 90, which is a favourable characteristic. In the bottom of the 80, about 16 fms. before the 90 end westward, we have begun to sink a winze, where the level will produce about 4 tons of ore per fm. In the 80 end west the level is very large, composed of peach, mudi, copper ore, tin ore, iron ore, alex., &c., but not of much value. 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With this week's MINING JOURNAL we give a SUPPLEMENTAL SHEET, which contains—The Great Eastern, One of the Wonders of the World; Mineral Wealth of South Africa—No. I, the Rocks and Mineral Deposits of Namaqualand; Geology—Private Lectures on the Earth—No. I, the Productions of the Present, and Relics of the Past; Mines and Minerals of America—No. VIII, the Coal Mines of Chiriqui, New Granada, and New Road across the Isthmus; Sorting Ores and Separating Metals by Electric Agency; Railway Construction—Permanent Way; Californian Life during the Gold Mania; Steam-Engines; Improvements in Steam-Boilers; Gold Quartz Liquefaction—Extraordinary Invention, &c., &c.

With last week's MINING JOURNAL we gave a SUPPLEMENTAL SHEET, which contains—Descriptions of Remarkable Mineral Veins—by Prof. D. T. Ansted, M.A., F.R.S., G.S.; Royal Institution: Prof. Phillips's fifth lecture on Geology; Government School of Mines: Lecture by Mr. Warrington Smyth, on the Ventilation of Mines; Bristol Mining School: Lecture by Mr. Thomas Austin, C.E., on Surveying, and Surveying Instruments; Original Correspondence: Colliery Explosion near Barnsley; the Lund Hill Colliery Explosion, near Barnsley—Letter to Sir George Grey; an Improved Davy Lamp; Mining in America—South Carolina; the Iron Question; Mining Prosperity—No. I; What is a Water-Gauge? A Geological Résumé; "Hammering it in"—Mr. Stride and Mr. Battye; Lead Mining in Spain; the Gold Fields of the Colony of Victoria—No. II, by Evan Hopkins, C.E., F.G.S.; the Sunbeam; "The Simplicity of the Creation"—Explosion of Gas in a Ship; Testing Machines; Iron; Perpetual Motion; Railway Permanent Way; the Metal Trades, &c.

## The Mining Market; Prices of Metals, Ores, &c.

METAL MARKET, London, March 6, 1857.

COPPER.		£. s. d.	BRASS (sheets).....p. lb.		13½-14d.
Copper wire.....	p. lb.	0 1 1½-1 7	Wire.....		13½d.
Ditto tubes.....	0	1 1½-1 7	Tubes.....		15d.-16d.
Sheeting and bolts..	0	1 1½-1 7	QUICKSILVER.....	p. lb.	1s 9d.
Bottoms.....	0	1 1½-1 7			
Old (Exchange).....	0	1 1½-1 7			
Best selected.....	p. ton	138 0-0-	Foreign.....	31	10-0-
Tough coke.....	138	0-0-	To arrive.....	31	5-0-1 7 6
Tie.....	138	0-0-			
South American.....	0	0-0-			
IRON.		per Ton.			
Bar, Welsh, in London.	8	10-0-8 15 0			
Ditto, to arrive.....	8	10-0-8 15 0	English blocks.....	146	0-0-nom.
Nail rods.....	9	10-0-9 15 0	Ditto, Bars (in barrels)	147	0-0-"
Stafford, in London	9	7-0-10 0-0	Ditto, Refined.....	151	0-0-"
Bars.....	9	0-0-10 10 0	Bones.....	150	0-0-151 0-0
Hoops.....	10	0-0-11 0-0	Straita.....	148	0-0-150 0-0
Sheet, single.....	11	0-0-11 10 0			
Fig. No. 1, in Wales ..	4	10-0-5 0-0	TIN-PLATES.*		
Ditto, refined metal, ditto.	4	10-0-5 0-0	IC Charcoal, 1st qua.	p. box.	2 0-0-2 1 0
Bars, common, ditto ..	7	12-6-7 15 0	IX Ditto 1st quality ..	2	0-0-2 7 0
Ditto, rail way, ditto ..	7	12-6-7 15 0	IC Ditto 2d quality ..	1	17-6-1 18 0
Ditto, Swed. in Lon. ..	15	0-0-17 10 0	IX Ditto 2d quality ..	2	3-6-2 4 0
In stock to arrive ..	15	0-0-17 10 0	IC Coke.....	1	14-6-1 15 0
Fig. No. 1, in Clyde ..	3	17-0-3 18 0	IX Ditto.....	2	0-0-2 1 6
Ditto, in Tyne and Tees.	3	11-0-3 15 0	Canada plates.....	p. ton	16 0-0-16 10 0
Ditto, forge.....	3	10-0-3 15 0	In London; 20s. less at the works.		
Staffordshire Forge Pig.	4	15-0-5 0-0	Yellow Metal Sheathing.....	p. lb.	13½d-14½d.
Welsh Forge Pig.....	3	15-0-4 0-0	Wetterstein's Pat. Met.....	p. cwt.	2 0-0-2 5 0
LEAD.			Stirling's Non-lamina- ting, or Hardened, Surface Rails, p. ton		9 0-0-9 2 0
English Pig.....	23	10-0-24 10 0	Stirling's Patent.....	Glasg.	— 5 5 0
Ditto sheet.....	24	10-0-24 15 0	Toughened Pigs.....	Wales	4 0-0-5 0 0
Ditto rod.....	25	0-0-25 10 0	Ditto.....		— 7 10 0
Ditto white.....	27	0-0-28 10 0	Indian Charcoal Pigs ..	in London	— 7 10 0
Ditto patent shot ..	27	0-0-28 10 0			
Spanish, in bond ..	25	0-0-25 10 0			
American.....	25	0-0-25 10 0			
FOREIGN STEEL.		none.			
Swedish, in kegs ..	22	0-0-22 10 0	MANGANESE.* (2i ewts.)		
To arrive.....	22	0-0-22 10 0	Green.....	p. ton	6 10-0-7 10 0
Ditto, in faggots ..	23	0-0-23 0-0	Grass Lump.....	5	5-0-5 10 0
English, Spring ..	18	0-0-23 0-0	Nasau ditto ..	3	15-0-4 0 0
			Ditto inferior.....	2	12 6-—

Four months' credit, and free on board at Rotterdam. The percentage of peroxide is about 60 for Nassau lump, 50 for Nassau inferior, 64 to 65 for Glissen, and 66 to 73 for ground.

REMARKS.—There is scarcely any alteration to report in our market, the same monotonous state of things existing as previously described. Enquiries continue to be of a very limited character, and it is difficult to effect sales at present rates. Foreign orders without limit are unimportant, and but few buyers are disposed to make consignments, consequently shipments have much diminished. A few good orders for America tend to support prices, otherwise it is not improbable some slight declension might take place, business being so extremely quiet.

COPPER.—There is, if anything, a little improvement in the demand. Our market is somewhat eased of second-hand parcels, and a few orders, differing in specification to those lots in the hands of speculators, have been executed at fixed quotations. The quantity of ores for sale at Swansea on the 17th is 1695 tons.

IRON.—This branch of our trade exhibits signs of inactivity; manufacturers for the most part have barely sufficient work to keep employed the full complement of men. Prices have undergone very trifling variation, but the tendency has been downwards. In Scotch pigs shipments have increased, which has had the effect of stiffening prices. Mixed numbers have been sold fully 2s. 6d. per ton better. The closing quotation on 'Change was 76s. to 76s. 3d., m.n., g.m.b., f.o.b. in Glasgow.

LEAD.—This article is in fair request, and sellers experience no difficulty in maintaining prices.

SPELTER.—Sellers have advanced their price to 31 1/2 10s., but at present business is not reported at that figure. The stock on the 1st inst. was 1168 tons.

TIN.—English is steady but quiet. No movement either way is likely to take place just yet with regard to this metal. Banca has changed hands at 148 1/2 to 150 1/2 10s.; Straits for arrival can be placed at 150 1/2 per ton.

TIN PLATES.—Prices have receded, and makers are now more disposed to enter orders.

LIVERPOOL, MARCH 5.—Since the date of our last report our market for manufactured Iron has presented no new feature calling for especial remark, the demand continuing to be steady, both for home consumption and for export. Dealers report a considerable enquiry, which, with the continued favourable accounts from the United States, will doubtless tend to maintain present prices. Makers of both Welsh and Staffordshire Iron report a fair amount of orders, sufficient to keep their works occupied, thereby preventing the probability of any immediate pressure to sell, and they look forward to a continued good demand, at all events, for some time to come. For rails, the enquiry is still moderate. Continued improvement is observable in Scotch Pig-iron, purchasers having come forward more freely, especially for forward delivery, and an advance of 2s. per ton has been established in warrants during the week, although for the last day or two the market has been somewhat flatter, caused doubtless by the aspect of political matters. The requirements for local consumption are on the increase, whilst for foreign ports, especially for the Continent, orders have been considerable, as may be judged from the fact that the shipments for the present week are to the very large extent of 13,418 tons, against 9333 tons for the corresponding week of last year, being an increase of 4085 tons, the total shipments since Jan. 1 to the present time showing an excess of upwards of 11,000 tons over the corresponding weeks of last year. With the admitted small stocks, it is not a matter of surprise that speculators should be induced to operate for a rise, and it is not improbable that a further advance may be established. The market for Tin remains without alteration; the demand is steady for positive consumption, and prices show no tendency to variation. Tin-plates are steady at current rates, with a moderate business doing. There is nothing new in Copper or Lead. The following are the quotations:—Iron: Merchant bar, 8 1/2 2s. 6d. to 8 1/2 10s. per ton.—Tin: Common block, 146 1/2 per ton; common bar, 147 1/2; refined block, 151 1/2.—Tin-plates: Charcoal, IC, 39s. to 39s. 6d. per box; coke, IC, 34s. to 34s. 6d.—Lead: English sheet, 24 1/2 per ton; English pig, 25 1/2.—Copper: Cake and tile, 135 1/2 per ton; best selected, 138 1/2; sheathing and bolt, 1s. 3d. per lb.—Yellow metal sheathing, 1s. 1 1/2 d.

GLASGOW, MARCH 5.—A considerable increase in the shipments caused a further improvement in our market, 76s. 6d. cash having been paid for warrants. The ministerial defeat, however, gave a check to speculation, and the price receded to 76s., at which it remains firm. To-day, little or no business has been done, the closing prices being 76s. buyers, 76s. 3d. sellers. No. 1, Gartsherrie, 79s. 6d. per ton; No. 1, g.m.b., 76s. 6d.; No. 3, g.m.b., 73s. 6d. Shipments:—Foreign, 6070 tons; coastwise,

7339 tons = 13,418 tons.—In the corresponding week last year they were 9333 tons, showing an increase of 4085 tons.

MINES.—Up to last week the drop in the standard for copper ores was trifling, and not such as to call forth any anxiety on the part of the miners, who may well be content if copper keeps at its present remunerative price. Lead, as we stated last week, is still advancing in price, and lead mines have a prospect of doing better than for some time past; whilst tin, high as it is, seems likely still to advance. Many of the old tin mines, the names of which had almost been forgotten, have been in demand, and are eagerly bought up; among these, St. Ives Consols have advanced to 100, 120, buyers. Margaret shares have not maintained the sudden rise, and have been flat during the week, at 60 to 65. Botallack advanced to 220, 225; the improvements in the mine, and the expected increase in the dividends, have caused enquiries for them. South Frances, 340 to 350, ex div. of 10 1/2 per share declared on Monday; in addition to this dividend (4960 1/2), 400 1/2 was charged in the accounts for the steam-whim, and 326 1/2 10s. 10d. half year's income-tax, so that the profit on the two months was in reality 5737 1/2 1s. 2d. Buller shares have been in demand, at 320; Basset, 230 to 235; Devon Consols, 450 to 460. For Herodasfoot shares the demand has been very great, and few to be met with at 6 to 7; the improvement in the south ground is such as to increase the returns, and warrant the expectation of early dividends. East Rose, 15, and more in demand; Nanteos and Penrhin shares advanced to 2, owing to a discovery, and a good business doing. Grambler and St. Aubyn, 110 to 115; the mine is looking better in the 36. Ludcott in demand, at 1 1/2, 2, 2 1/2; the new engine-shaft has drained the mine to the 20, and the lode improved. Gonamena, 16 to 17; the shoot of ore worked in the 50 has been met with in the 70, and the prospects of the mine are improving. Drake Walls, 3 to 3 1/2; Tin-roft shares have been sought after, at 4 1/2 to 4 3/4; North Robert, 25 to 26; in West Grenville, an improvement having taken place, a very large business has been done, at prices varying from 5s. to 6s., and 7s.; Wheal Trelawny, 24, buyers; Carrigill shares, owing to a good improvement in the mine, have been dealt in at 25 to 27 1/2; Carn Brea shares in demand, at 55 to 60, and there seems a probability of the mine paying regular dividends again. At Ding Dong, the dividend was 1 1/2 per share; shares, 32 1/2 to 35; Trevelyan Consols, 16 to 18. Rosewarne and Herland shares have been flat, at 8 to 8 1/2; the lode in the 8 fm. level east, below adit, is split, the north part producing a little tin; the winze has been sunk 3 fms. below the level, and continues rich; in the 18 fm. level there is a solid leader of yellow copper ore and munda, 4 to 6 in. wide, saving work. Great Work declared a dividend of 7 1/2 10s. per share on Feb. 27. Wheal Wrey, 7 1/2 to 7 3/4; Trevelyan, 3 1/2 to 3 3/4. Vale of Towey has much improved in the bottom level (the 50), and a large business done in the shares, at 18s. to 21s. East Alfred shares have been very largely sold in, the price advancing from 36s. to 42s. 6d.; the end west is improving, and getting into a better channel of ground. Great South Tolgus were rather flat at the beginning of the week, but the mine has improved, and shares more sought after, at 15 1/2 to 16; South Carn Brea rather flat, at 7 to 7 1/2; North Crofty, 7 to 7 1/2; North Basset shares, considering the position of the mine, have been unaccountably flat, at 33 to 34, and ought to be worth buying; West Basset, 35 1/2 to 36, firm; Lelant Consols, 4, and shares largely dealt in; East Margaret, 10 1/2 to 11; Kitty (Lelant), 20; Great Alfred shares have remained steady, at 9 1/2 to 10; Alfred shares have been in request, at 23 to 24; Castell, 11s. 6d. to 12s. 6d. East Clifford, on the Wheal Clifford lode, has been introduced to the market as a good speculation, and shares dealt in at 1 1/2; Hington Down, 4 1/2, enquired for; Bedford United, 8 to 8 1/2; East Gunns Lake, 1 1/2 to 2; Trevelyan, 6 1/2; Drake Walls, 3 1/2; Arthur, 8 1/2; Wheal Edward extensively dealt in, and price advanced to 5 1/2; Sortridge Consols, 1 1/2 to 1 3/4; Wheal Harriett flat, at 20s. to 21s.; Pollard, 15s.; Pendene, 1 1/2 to 2 1/2; Lady Bertha more in demand, at 3 1/2 to 4; South Tolgus, 150 to 155; Wheal Kitty (St. Agnes), 8 1/2 to 9; North Frances were flat, but rallied to 18 1/2; East Buller shares have been enquired for at low prices, and several sales made at 22s. to 12 1/2; Par Consols, 23 1/2 to 24, ex div. of 1 1/2, per share declared this week; Penhalbarva, 22; North Penhalbarva, 4 to 6; West Caradon, 170, buyers; South Caradon, 340 to 350.

### Mining Exchange Official List of transactions during the week:—

SATURDAY, FEB. 28.—Buller and Basset, 2 1/2 to 3; Castell, 12s. 6d. to 11s. 6d.; Ding Dong, 32 1/2; East Rose, 15; Nanteos and Penrhin, 1 1/2; Pendene, 36s. 6d. to 35s. 6d.; Lady Bertha, 14s. 6d. to 15s.; Trevelyan, 3 1/2 to 3 3/4; Wheal Edward, 5 1/2 to 5 3/4; West Basset, 35 1/2 to 36; South Carn Brea, 55 to 60; East Margaret, 10 1/2 to 11; Kitty (Lelant), 20; Great Alfred, 20; East Clifford, 9 1/2 to 10; Alfred, 23 1/2 to 24; Castell, 11s. 6d. to 12s. 6d.; East Tolgus, 150 to 155; Wheal Kitty (St. Agnes), 8 1/2 to 9; North Frances, 18 1/2 to 19; East Buller, 22 1/2 to 23; Par Consols, 23 1/2 to 24, ex div. of 1 1/2, per share declared this week; Penhalbarva, 22; North Penhalbarva, 4 to 6; West Caradon, 170, buyers; South Caradon, 340 to 350.

MONDAY, FEB. 29.—Buller and Basset, 2 1/2 to 3; Castell, 12s. 6d. to 11s. 6d.; Ding Dong, 32 1/2; East Rose, 15; Nanteos and Penrhin, 1 1/2; Pendene, 36s. 6d. to 35s. 6d.; Lady Bertha, 14s. 6d. to 15s.; Trevelyan, 3 1/2 to 3 3/4; Wheal Edward, 5 1/2 to 5 3/4; West Basset, 35 1/2 to 36; South Carn Brea, 55 to 60; East Margaret, 10 1/2 to 11; Kitty (Lelant), 20; Great Alfred, 20; East Clifford, 9 1/2 to 10; Alfred, 23 1/2 to 24; Castell, 11s. 6d. to 12s. 6d.; East Tolgus, 150 to 155; Wheal Kitty (St. Agnes), 8 1/2 to 9; North Frances, 18 1/2 to 19; East Buller, 22 1/2 to 23; Par Consols, 23 1/2 to 24, ex div. of 1 1/2, per share declared this week; Penhalbarva, 22; North Penhalbarva, 4 to 6; West Caradon, 170, buyers; South Caradon, 340 to 350.

TUESDAY, MARCH 1.—Buller and Basset, 2 1/2 to 3; Castell, 12s. 6d. to 11s. 6d.; Ding Dong, 32 1/2; East Rose, 15; Nanteos and Penrhin, 1 1/2; Pendene, 36s. 6d. to 35s. 6d.; Lady Bertha, 14s. 6d. to 15s.; Trevelyan, 3 1/2 to 3 3/4; Wheal Edward, 5 1/2 to 5 3/4; West Basset, 35 1/2 to 36; South Carn Brea, 55 to 60; East Margaret, 10 1/2 to 11; Kitty (Lelant), 20; Great Alfred, 20; East Clifford, 9 1/2 to 10; Alfred, 23 1/2 to 24; Castell, 11s. 6d. to 12s. 6d.; East Tolgus, 150 to 155; Wheal Kitty (St. Agnes), 8 1/2 to 9; North Frances, 18 1/2 to 19; East Buller, 22 1/2 to 23; Par Consols, 23 1/2 to 24, ex div. of 1 1/2, per share declared this week; Penhalbarva, 22; North Penhalbarva, 4 to 6; West Caradon, 170, buyers; South Caradon, 340 to 350.

WEDNESDAY, MARCH 2.—Buller and Basset, 2 1/2 to 3; Castell, 12s. 6d. to 11s. 6d.; Ding Dong, 32 1/2; East Rose, 15; Nanteos and Penrhin, 1 1/2; Pendene, 36s. 6d. to 35s. 6d.; Lady Bertha, 14s. 6d. to 15s.; Trevelyan, 3 1/2 to 3 3/4; Wheal Edward, 5 1/2 to 5 3/4; West Basset, 35 1/2 to 36; South Carn Brea, 55 to 60; East Margaret, 10 1/2 to 11; Kitty (Lelant), 20; Great Alfred, 20; East Clifford, 9 1/2 to 10; Alfred, 23 1/2 to 24; Castell, 11s. 6d. to 12s. 6d.; East Tolgus, 150 to 155; Wheal Kitty (St. Agnes), 8 1/2 to 9; North Frances, 18 1/2 to 19; East Buller, 22 1/2 to 23; Par Consols, 23 1/2 to 24, ex div. of 1 1/2, per share declared this week; Penhalbarva, 22; North Penhalbarva, 4 to 6; West Caradon, 170, buyers; South Caradon, 340 to 350.

THURSDAY, MARCH 3.—Buller and Basset, 2 1/2 to 3; Castell, 12s. 6d. to 11s. 6d.; Ding Dong, 32 1/2; East Rose, 15; Nanteos and Penrhin, 1 1/2; Pendene, 36s. 6d. to 35s. 6d.; Lady Bertha, 14s. 6d. to 15s.; Trevelyan, 3 1/2 to 3 3/4; Wheal Edward, 5 1/2 to 5 3/4; West Basset, 35 1/2 to 36; South Carn Brea, 55 to 60; East Margaret, 10 1/2 to 11; Kitty (Lelant), 20; Great Alfred, 20; East Clifford, 9 1/2 to 10; Alfred, 23 1/2 to 24; Castell, 11s. 6d. to 12s. 6d.; East Tolgus, 150 to 155; Wheal Kitty (St. Agnes), 8 1/2 to 9; North Frances, 18 1/2 to 19; East Buller, 22 1/2 to 23; Par Consols, 23 1/2 to 24, ex div. of 1 1/2, per share declared this week; Penhalbarva, 22; North Penhalbarva, 4 to 6; West Caradon, 170, buyers; South Caradon, 340 to 350.

FRIDAY, MARCH 4.—Buller and Basset, 2 1/2 to 3; Castell, 12s. 6d. to 11s. 6d.; Ding Dong, 32 1/2; East Rose, 15; Nanteos and Penrhin, 1 1/2; Pendene, 36s. 6d. to 35s. 6d.; Lady Bertha, 14s. 6d. to 15s.; Trevelyan, 3 1/2 to 3 3/4; Wheal Edward, 5 1/2 to 5 3/4; West Basset, 35 1/2 to 36; South Carn Brea, 55 to 60; East Margaret, 10 1/2 to 11; Kitty (Lelant), 20; Great Alfred, 20; East Clifford, 9 1/2 to 10; Alfred, 23 1/2 to 24; Castell, 11s. 6d. to 12s. 6d.; East Tolgus, 150 to 155; Wheal Kitty (St. Agnes), 8 1/2 to 9; North Frances, 18 1/2 to 19; East Buller, 22 1/2 to 23; Par Consols, 23 1/2 to 24, ex div. of 1 1/2, per share declared this week; Penhalbarva, 22; North Penhalbarva, 4 to 6; West Caradon, 170, buyers; South Caradon, 340 to 350.

### On the Stock Exchange, the following business has been transacted:—

SATURDAY, FEB. 28.—Alfred Consols, 22 1/2 to 23; Great South Tolgus, 16 1/2 to 16; Great Wheal Alfred, 9 1/2 to 10; North Frances, 18 1/2 to 19; South Wheal Alfred, 34; Tincroft, 4 1/2 to 4 3/4; ex div.; Wheal Edward, 4 1/2 to 5; Transactions, though not officially marked: Wheal Margaret, 32, 33, 32 1/2; Vale of Towey, 18s. 6d.; Penhalbarva, 22s. 6d.; Port Phillip, 5s. to 5s. 6d.; San Fernando, 5s. to 5s. 6d.

MONDAY, FEB. 29.—Devon Consols, 45 1/2 to 46; East Basset, 65 to 65 1/2; Great Wheal Vor, 6; North Frances, 18 1/2 to 19; South Carn Brea, 7 1/2 to 8; Tincroft, 4 1/2 to 4 3/4; Wheal Edward, 5 1/2 to 5; Marquitta, 3 1/2 to 3 3/4; Port Phillip, 5; United Mexican, 4 1/2 to 4 3/4; Transactions, though not officially marked: Wheal Margaret, 63 1/2 to 64; Par Consols, 23 1/2 to 24; West Wheal, 9 1/2 to 10 1/2; Vale of Towey, 18s. to 19s. 6d.; East Alfred, 38s. 40s., 41s.; South Cornwall, 8s.

TUESDAY, MARCH 1.—Great Wheal Alfred, 10; South Wheal Frances, 35 1/2 to 36; Vale of Towey, 18 1/2 to 19; Wheal Edward, 5 1/2 to 5; Coburn Copper, 59, 58 1/2, 59 1/2; Fortuna, 1 1/2 to 1 3/4; Linarres, 7 1/2 to 8; Santiago de Cuba, 2 1/2 to 3; United Mexican, 4 1/2 to 4 3/4; Transactions, though not officially marked: Wheal Margaret, 63, 64, 65, 66; Vale of Towey, 18s. to 20s.; Drake Walls, 3 1/2 to 3 3/4; Trevelyan, 3 1/2 to 3 3/4; Great Wheal Vor, 6; Lady Bertha, 14s. 6d.; Herodasfoot, 4 1/2; Trevelyan Consols, 16 1/2 to 17; Nanteos and Penrhin, 1 1/2 to 1 3/4; Port Phillip, 5s. to 5s. 6d.

WEDNESDAY, MARCH 2.—North Frances, 18 1/2 to 19; Tincroft, 4 1/2 to 4 3/4; Vale of Towey, 1; Wheal Edward, 5 1/2 to 5; Santiago de Cuba, 2 1/2 to 3; United Mexican, 4 1/2 to 4 3/4; Transactions, though not officially marked: Wheal Margaret, 63 to 64 1/2; East Margaret, 11 1/2 to 12; West Wheal, 9 1/2 to 10 1/2; Vale of Towey, 18s. 6d. to 19s. 6d.; West Grenville, 6s. 6d. to 7s. 6d.

THURSDAY, MARCH 3.—Alfred Consols, 22; Great Wheal Alfred, 10; Port Phillip, 5; Sortridge Consols, 1 1/2 to 1 3/4; Tincroft, 4 1/2 to 4 3/4; Wheal Buller, 310; Wheal Trelawny, 22; St. John del Rey, 20 1/2; Marquitta, 3 1/2 to 3 3/4; United Mexican, 4 1/2 to 4 3/4; Transactions, though not officially marked: Botallack, 225; East Alfred, 3 1/2 to 3 3/4; Wheal Harriett, 1 1/2 to 1 3/4; Wheal Pollard, 15s. to 16s. 6d.; Port Phillip, 5s. to 5s. 6d.

FRIDAY, MARCH 4.—Alfred Consols, 22 1/2 to 23; Great South Tolgus, 16 1/2 to 16; Great Wheal Alfred, 9 1/2 to 10; North Frances, 18 1/2 to 19; South Wheal Alfred, 34; Tincroft, 4 1/2 to 4 3/4; ex div.; Wheal Edward, 4 1/2 to 5; Transactions, though not officially marked: Wheal Margaret, 32, 33, 32 1/2; Vale of Towey, 18s. 6d.; Penhalbarva, 22s. 6d.; Port Phillip, 5s. to 5s. 6d.; San Fernando, 5s. to 5s. 6d.

FRIDAY.—North Frances, 18 1/2 to 19; South Wheal Frances, 35 1/2 to 36; Tincroft, 4 1/2 to 4 3/4; Wheal Edward, 4 1/2 to 5; Wheal Kitty (Ury), 10 1/2 to 11; Coburns and Calaba, 2 1/2 to 3; Marquitta, 3 1/2 to 3 3/4; United Mexican, 4 1/2 to 4 3/4; Transactions, though not officially marked: Trevelyan, 3 1/2 to 3 3/4; Vale of Towey, 18s. 6d.; Port Phillip, 5s. to 5s. 6d.; San Fernando, 5s. to 5s. 6d.

The arrivals of ores and metals during the week are as follows:—

MONDAY.—In London, 250 cases zinc and 22 cases rolled zinc from Belgium, 212 bags copper ore from Sydney, 1847 cases spelter from Hamburg.

TUESDAY.—In London, 384 pigs lead from Spain, 133 barrels oxide zinc from Belgium, 18 cases iron from Sydney.

WEDNESDAY.—In London, 327 cases zinc from Belgium, 23 bags copper ore from Port Phillip, 223 cases spelter from Hamburg, 237 pigs lead from Spain.

THURSDAY.—In London, 8 cases copper from Loughor, 168 bars iron from Sweden, 1500 pigs lead and 7147 cases spelter from Hamburg, 713 cases spelter, and 200 tons tin from Holland, 66 cases and 41 cases rolled zinc from Belgium.

FRIDAY.—In London, 223 parcels iron from Sweden.

At Pool Ticking, on Thursday, 2918 tons of ore were sold, realising 21,511 7s. 6d. The particulars of the sale were—Average standard, 160 1/2 3s.; average price, 7 1/2 7s. 6d.; average produce, 6 1/2; quantity of fine copper, 196 tons 14 cwt. The sale at Redruth, on Thursday next, will comprise 4847 tons.

The Ticking at Swansea, on Tuesday, comprised 1670 tons of copper ore, and realised the sum of 24,378 3s. 6d. Knocknabon had 413 tons, and 5699 3s. 6d.; Coburn, 335 tons, 6090 7s. 9s.; Cuba, 293 tons, 4961 9s.; French Slag, 147 tons, 618 1/2; Berehaven, 90 tons, 1075 10s.; Cronbane, 80 tons, 407 1/2 6d.; Tigrony, 3 tons, 105 1/2; Forest Slag, 61 tons, 224 1/2 3s. 6d.; Wheal Maria, 37 tons, 1263 11s.; Springbok, 59 tons, 1933 12s.; Holyford, 40 tons, 853 8s.; Bannpylde, 39 tons, 549 18s.; Dyliff, 29 tons, 269 14s.; South Manx, 23 tons, 109 1/2; Marneille, 15 tons, 121 1/2 6d.; Severn, 6 tons, 46 18s. 6d. The next sale, on March 17, will comprise 1695 tons, and include ores from Coburn, Santiago, Cuba, Seville, Springbok, Wheal Maria, Namaqua, Chili, and Spanish.

At New York (Feb. 21), the metal market has exhibited considerable firmness, the stock on hand being very small. Scotch pig-iron was in demand. Banca tin showed an improvement. In English lead, the stock was materially reduced, consequently a higher rate was obtained.

In Saltpetre, there has been rather a large amount of business throughout the week, and prices have been fully maintained. Calcutta, 44s. to 47s., and floating parcels have reached 44s. 6d.

The following dividends have been declared during February:—

Mines.	Per share.	Amount.
North Basset	£0 15 0	£4500 0 0
Wheal Basset	8 0 0	4096 0 0
Providence Mines	3 0 0	2800 0 0
Alfred Consols	0 9 0	2800 0 0
Carn Brea	2 0 0	2000 0 0
Wheal Clifford	2 0 0	2000 0 0
West Seton	5 0 0	2000 0 0
Wheal Margaret	4 0 0	1920 0 0
Liaburne	4 0 0	1800 0 0
Tincroft	0 5 0	1500 0 0
Powey Consols	0 6 0	1482 0 0
Botallack	6 0 0	1250 0 0
Bedford United	0 5 6	1200 0 0
Dolcoath	6 0 0	1200 0 0
Condarrow	4 0 0	1024 0 0
East Pool	7 10 0	960 0 0
East Daren	3 0 0	900 0 0
Great Work	7 10 0	892 10 0
Wheal Trelawny	0 15 0	780 0 0
St. Ives Consols	8 0 0	752 0 0
Wheal Owles	9 0 0	720 0 0
Eyam (Derbyshire)	0 10 0	700 0 0
Rosewarne United	1 0 0	612 0 0
Wheal Jane (Kes)	1 0 0	612 0 0
Wheal Seton	2 10 0	512 0 0
Levant	2 0 0	320 0 0
Wheal Grylls	0 2 0	102 8 0
Total		£38,116 18 0



FIRST SALE IN MARCH.						
Years.	Tons.	Prod.	Amount.	Standard.	Ore copper.	Cake copper.
1848	3237	7%	\$17,503 3 0	\$12 16 0	\$58 3 0	\$93 6-4/16 0
1849	3684	8	19,832 16 6	105 18 0	70 18 0	84 10
1850	3969	7	21,409 16 6	113 6 0	75 13 0	88 10
1851	3487	7 1/2	16,463 12 6	103 3 0	65 4 0	84 0
1852	3380	7	16,667 3 6	111 18 0	73 17 0	85 10
1853	3283	6 1/2	23,274 8 0	164 9 0	119 2 0	133 0
1854	3685	6	16,024 10 0	134 13 0	101 2 0	126 0
1855	2443	7 1/2	17,962 10 0	139 6 0	101 7 0	126 0
1856	3120	6 1/2	20,473 8 6	138 2 0	97 5 0	128 0

The figures in the ore column express the net price per ton of copper paid to the miner.







the duties of the office. The number was again increased, and the remuneration was augmented. With this last concession the public, as well as the Inspectors, appeared satisfied.

This being so, how is it, we again ask, that these fearful sacrifices of human life continue with unabated violence? In both of the late explosions we have no evidence of the recent visits of the Inspector, although the Cymer and Lund Hill Collieries were notoriously known as being in a most dangerous condition. Such cases should have the constant and especial attention of the Inspector, and he ought to see that every possible precaution is used in mines daily—nay, hourly—exposed to these terrific accidents. He ought never to forget that his principal duty is to PREVENT ACCIDENTS, whereas, from the reports in the newspapers, they appear to act as if their office were merely that of a policeman, displaying their zeal in hauling offenders against the rules before the magistrates, and suing for penalties. It is all very well that an infraction of the rules should not be allowed to pass with impunity, but it is an abuse of the powers of his office when the Inspector neglects his more onerous duties in order to play the Dogberry before a country justice. An instance of this kind lately occurred in South Wales, where an information was laid by the Inspector against the Dowlais Company, respecting water-gauges, which occupied much time, and led to no practical result; whilst the collieries of that company, which have been officially reported as being in anything but a creditable condition, have received no public notice. Again, in the case of Lund Hill, the Inspector seizes with avidity an accidental admission of a witness that the rules had not been observed, but omits to tell us how it is that he did not exert his authority to compel the observance of them, especially as had he done so it is probable that this dreadful accident would not have occurred. The Inspectors will but ill deserve the confidence of the colliers, and of the public, if they content themselves with merely sitting on inquests and acting as assessors to the coroners, and assuming the character of policemen at petty sessions. To a certain extent this may be necessary, but they ill discharge the duties imposed on them if they do not daily inspect at least one colliery, and use their utmost efforts to prevent accidents rather than allow a mine to continue in a highly dangerous condition, whilst their whole time, or a large portion of it, is devoted to matters of infinitely less importance. Even the conviction of parties through whose culpability an explosion has been occasioned is a miserable compensation for the destruction of the poor colliers, and it can give but little satisfaction to the bereaved families of the 300 men who lost their lives in the Cymer and Lund Hill explosions to know that, although no efforts were made by the Inspector to prevent these deplorable calamities, yet no efforts were left untried, no diligence was wanting, to ensure the punishment of the parties implicated.

We make these remarks with regret, but with a firm conviction there is ample occasion for them; and in conclusion, we would faintly impress on the minds of the Inspectors that their highly important mission is emphatically to prevent accidents in mines, and that unless frequent and thorough examinations of the works in collieries be made, we shall despair of any material alleviation in the miseries and evils to which the working collier is now so deplorably exposed.

The allusion which we made last week to the subject of Mr. Squire's process, for the production of gold from auriferous matrices, has led to several communications on the point, or rather queries as to the precise method and system of the operation. It seems to have roused our readers to the reconsideration of the question which has so long confused the learned, or, professedly so, in such matters, and which has necessarily led to much perplexity and disappointment to those who have entertained the matter in a commercial point of view.

With the details of method or system we have nothing to do in editorial remarks. We merely mentioned the fact of the apparently successful issue of the tests of Mr. Squire's principle, and pointed out the general results, but we must leave those more acutely interested in the production of gold from quartz, and other substances, to determine for themselves the practicability of the process, in a commercial sense. We have before stated that discoverers of chemical appliances to such points contend that what is done in the laboratory can be effected with equal success at the mine, and in this view of the question Mr. Squire does not differ from his scientific contemporaries. He has now operated on quartz from the south-west of Ireland with brilliant success, inasmuch as the matrix, which previous to undergoing the process was apparently wholly devoid of gold, was made to show it in globules on surface clear to the naked eye. "Gold in England" will evidently be a question for the further consideration of the scientific world, as well as the more general public; and as so many events have recently occurred to disturb, to some extent, the accepted rules of geology, it is quite possible that the more practical men will be the successful competitors in solving this long-pending point. It is undoubtedly one of peculiar and lively interest. Success to a moderate extent would silence carping adversaries, and justify those who from the beginning of this vexed question have held that the search for gold in England was founded on reasonable considerations.

Although many of our readers are tolerably conversant with the customs of the tin bounds of Cornwall, yet we venture to say that comparatively few of them have ever heard of an almost identical mining custom which obtains in the High Peak district of Derbyshire. The custom to which we refer is one by which it is lawful for all the subjects of this realm to search for, sink, and dig mines or veins of lead ore upon, in, or under all manner of lands, of whose inheritance soever they may be (churches, churchyards, places for public worship, burial grounds, dwelling houses, orchards, gardens, pleasure grounds, and highways excepted). But if no vein of ore be found, and the person making search discontinue it for 14 days, he must level and make good the land disturbed within the space of six days after the expiration of the above-mentioned 14 days; or the owner of the land may level and make good the same, and recover the expenses thereof from the miner in an action of debt in the small Barmote Court, or in the County Court. The custom also provides that nothing shall prevent or hinder the miner from following and working his vein, and searching for and getting lead ore under any of the above excepted places. If, however, in so doing he should damage or injure any such excepted places, or the surface thereof, the owner or reputed owner and occupier may recover from such miner compensation for such damage or injury by action in the County Court, if the damage shall not exceed 50s., or otherwise by action in the superior courts; but in case the owner or reputed owner or occupier of any such excepted places apprehends that such working will endanger the security of such excepted places, the steward and grand jury have power to suspend the working of such vein, or to direct the working thereof, so as to prevent any damage.

The above custom has been sanctioned by Parliament by an Act passed so lately as the year 1851, which, with some modifications, re-institutes all the old mining customs of the High Peak district. The old customs, though they were for the most part merely oral traditions, had been reduced into doggerel by MANLOVE, an edition of whose work, by TAPPING, thus describes the above custom:—

"By custom old in Wirksworth's Wapentake,  
If any of this nation find a rake,  
Or sign or leading to the same, may set  
In any ground, and there lead ore may get.  
They may make crosses, holes, and set their stows,  
Sink shafts, build lodges, cottages, or coes,  
But churches, houses, gardens, all are free  
From this strange custom of the miners."

Living as we do in the nineteenth century, when the rights to and the rights of property are so jealously guarded, that the mere breaking of a twig from a tree is immediately followed up by either a criminal or a civil proceeding, and sometimes by both—living in such an age, it is almost impossible to realise the notion that land was once of so trifling a value, and that landed proprietors were once so careless of their rights that by force of repeated acts of more trespass the above custom at length prevailed, by virtue of which "all the subjects of this realm may search for, sink, and dig mines of lead ore within the High Peak district." It is true that the same customs provided that the owner of the soil should receive a portion of the mineral produce, yet such portion has not for many generations been considered by the lords to be an equivalent for their rights disturbed; and the miners have, during the same time, regarded their custom and right to mine as a valuable one, so that it follows that of late years the custom has been a sore burden to the landowners of the High Peak. It is also matter of history that on several occasions, especially during late years, the landlairs have endeavoured to throw off the customary yoke, but always without success; for the customs had been at so early a period so firmly and so clearly established that all attempts to do so, strenuous though they were, always proved abortive.

We have been induced to make the above observations, not so much to

interest and amuse our readers with the history of the mining customs of Derbyshire as to draw to their attention the valuable fact that every subject of this realm has a right to mine in the lead district of that shire—a right which may now be safely exercised under the protection of the Limited Liability Principle. Indeed, we have always been surprised that a district so rich in mineral treasures should be so closely confined to the enriching of local adventurers; but we doubt not that before long other capital and other enterprise will be applied to the realising of the mineral treasures of the High Peak—an application which will result in good to "One and All."

A suggestion was laid before a recent committee of the Royal Cornwall Polytechnic Society, that a scientific man be deputed by the Society to spend a few months in giving very simple lectures on Science as applied to Mining, to miners in their own localities. He would be able to describe the improvements in machinery, and in the working of mines in other places; he would gain from the miners their views; he would encourage them in the pursuit of any chosen line of study; and he would assist ingenious men by his advice in their inventions.

This suggestion met with cordial sympathy from the gentlemen present, many of them expressing an opinion that it was just what the county wanted. Beyond this, some of the committee expressed their willingness to add to the Society's means, to enable them to carry out the idea. It was felt, however, that nothing could be done until it was ascertained upon what terms a sufficiently competent person could be retained for this important duty, and the amount of assistance upon which the Society could calculate. It appears to us that there is in this suggestion those elements of good which must work. In every mining district (we speak from personal experience) there is manifested a strong desire amongst the miners for the means of acquiring knowledge. Although we have heard many discussions as to the advantages of a central Mining School, we have never heard but one opinion on the great benefits which would result to all engaged from the introduction of some improved scientific knowledge amongst the miners themselves.

The plan suggested appears to us to meet all the difficulties of the case in Cornwall. There is a Mining School at Truro, but the teachers there are too fully occupied to undertake such a task as that proposed, and it is quite impossible that the working man could attend any lectures, or any means of instruction, far from the scenes of his labours. Such a system of itinerant instruction would, if properly carried out, and the task placed in judicious hands, tend much to the benefit of all the societies in the county, and especially of the Truro Mining School.

Knowing the character of the working miner thoroughly, and feeling conscious that there are amongst that important class of labourers numerous minds of great capacity, who have within them all the elements required for the production of the correct thinker and the ardent investigator, it could not be otherwise than that, from the classes thus formed numerous students would arise anxious for further instruction at the Mining School.

The means of doing this are wanting; surely this cannot long continue to be the case. There are in Cornwall four county societies—the Royal Institution and the Mining School at Truro, the Geological Society of Cornwall at Penzance, and the Royal Cornwall Polytechnic Society at Falmouth.

Supposing each of these societies taxed themselves for this important experiment for the next three years to the small extent of 25s. each per annum, we cannot but think the Duchy of Cornwall would aid, if the plan were properly digested and submitted to one so earnest for the improvement of the industrious classes as His Royal Highness PRINCE ALBERT to a similar extent. We feel certain that a great number of the paying mines would annually subscribe, and we know of several gentlemen who are ready to add to such a fund, if the project be fairly started, and occasionally the dues of the Stannaries Court might be obtained. Indeed, under the proper auspices, there can be no difficulty in raising (say) 2500l. per annum. This sum would, with small contributions from the miners themselves—say one penny each lecture—be sufficient to ensure the services of a man competent for the work, and earnest in the cause, and to meet the working expenses of the experiment.

The proposition is so excellent that we earnestly hope the friends of Education will not allow it to fail; and we shall be very glad to receive suggestions and offers of aid in furtherance of the object.

The Government, having been defeated by a majority of sixteen on Mr. COWEN's resolution condemnatory of the recent proceedings at Canton, has advised HER MAJESTY to dissolve Parliament. The political influences which have led to this result, and the possible state of political parties which it may bring about, are not subjects for speculation or discussion in these columns. We have simply to deal with the fact that we are about to have a general election, and to estimate, as nearly as we can, how far the great commercial interests of the country may be affected thereby.

Time was, when party feeling ran high, when the announcement of the dissolution of Parliament would be received throughout the country with the most feverish anxiety, producing in every town and county in the kingdom an interest and excitement quite incompatible with due and proper attention to ordinary business engagements, which would be, indeed, for the time partially suspended. Then, although nobody in his heart believed it, the cry "The constitution is in danger!" roused all sects and parties to active efforts to preserve the constitution, by the return, of course, of the man who thought as they happened to do.

Times are changed. The once potent cries of party are heard no more, and men, now-a-days more sensible, estimate the worth of a candidate for parliamentary honours by his reasoning and opinions on details of practical value to the country, and his ability to enforce his views on the Legislative Assembly. Our legislators and statesmen, perfectly conscious of the altered state of things which many of them have contributed to bring about, commend themselves now to constituencies, and bid for their "sweet voices," by setting forth how far they are advanced in the march of progress, and what practical measures they will introduce or support for the advantage of the country. Thus it is that no probable or possible change of Government can now take place without some decided benefit to the country at large. The estimates will be critically revised—all branches of taxation will undergo a rigid scrutiny; and, in the meantime, despite the passing excitement of local contests, where personal feelings may run somewhat high, the confidence of the country in the stability of our institutions will maintain our commercial enterprises at pretty much their ordinary level.

In great public undertakings, more particularly as, in our mines for instance, the demand for our produce remaining unaffected by the state of parties, the industry of the country can receive no check. We anticipate that the returns for the three months which will intervene before the meeting of the new Parliament, will show no diminution in the progressive development of our mineral resources.

We do not outstrip the bounds of our strictly non-political character prescribed to us, when we remind our readers, in mining districts especially, of the proposal made last year to rate mines. It may not, therefore, be amiss that candidates for the representation of mineral districts should be instructed in the rights of the constituencies; and although the tendency of our recent legislation is decidedly adverse to the resumption of class taxation, yet "to be forewarned is to be forearmed," and "prevention is better than cure."

#### THE TIN TRADE.

Messrs. Dadelzen and Co. report that the rise in this article, which they anticipated (*Mining Journal*, Feb. 7), has been fully realised, and a considerable business has been done during the past month at prices steadily advancing from 146s. to 150s. In the early part of the month, consumers being bare of stock, purchased freely, both on the spot and to arrive. The highest price was reached on Feb. 6, when 1000 slabs Straits to arrive were sold at 150s., and a parcel for cash down at 149s.; also Banca at 150s. cash. On Feb. 9, English tin was advanced 4l. on common, and 2l. on refined. The small advance on refined puzzled the consumers, and there now being a great disadvantage in buying foreign instead of refined, the demand is limited to those who cannot get supplies of the latter; but as the quantity of English refined produced is only one-third of the tin annually consumed for tin-plates, the demand for foreign must shortly become more general.

The smelters will not sell freely, being bare of stock, and as the tin-plate manufacturers do not, we fancy, hold more than a month or six weeks' supply, we anticipate a renewed advance in the course of this month. At the moment, the market is quiet, but firm—Banca 150s., and Straits 148s. The last price paid in Holland was 92 frs., which is equal to 159s. delivered here. The present stock of tin in Holland is 18,082

slabs, against 45,886 same time last year; and the quantity arrived towards the next sale 120,337 slabs, against 100,280 in 1856.

The import of tin into London since Jan. 1 has been as follows:—Straits, per City of Bristol, 2243 slabs; per *Persepolis* Oliver, 2357; per *Edgar Atheling*, 1424 = 6024 slabs.—Banca, from Holland, 2900 slabs. Total, 8924 slabs; and we believe the deliveries to have been considerably above this, the stock here being reduced to 475 tons.

During the year 1856, the import of foreign tin was 3464 tons, against 1612 tons in 1855, and 2250 tons in 1854. The exports were—

	1856.	1855.	1854.
Foreign	Tons 250	280	676
English	Tons 1850	1530	1495
The export of tin during all January was—			
	1856.	1857.	
English	Tons 157	241	
Foreign	1	25	

According to the advices just received from Singapore and Penang, tin continued extremely scarce there, and higher prices paid. At Penang, the quotation is 31s., and at Singapore 33s. The exports to Great Britain from Singapore up to Dec. 15, 1856, were 12,225 pekuls = 727 tons; 1855, 10,338 pekuls = 626 tons. The exports from Jan. 16 to Dec. 15 were 640 pekuls = 32 tons. From Penang, the exports to England, Continental Europe, and America, in 1856, were 29,907 pekuls = 1776 tons; and in 1855, 21,950 pekuls = 1303 tons.

#### NOVEL TREATMENT OF POOR COPPER ORES.

In our last Journal, we alluded to a process which has been successfully practised in Norway, for the reduction of poor ores of copper; at the same time we mentioned that operations of nearly the same nature were being conducted at Twista, in Germany. It appears, however, that at the latter place they use scrap iron and acids for the reduction of the mineral to metal; and, consequently, some outlay is required in order to render the ore available. In the Norwegian process, however, according to the subjoined account, only water and fuel is required, and a sufficient quantity of iron pyrites, or mundic ore. This process was first practically brought into operation by Bergmeister Sindling, and has, both at the Földal and Eker Works, been found to answer successfully. We are not in possession of the minutiae of the operations, but we give the results, and some brief details, furnished by one who has practically superintended and carried out the process:—

Low quality of copper ore, no matter of what kind, which cannot be reduced any other way, may be rendered productive at a proportionally small expense, with little fuel, and no very large plant, provided a certain quantity of iron pyrites is to be obtained at a low price. If the ore is to be treated already contain munda, the less iron pyrites is required; if quite free from sulphur, the more is necessary; but for a portion of the quantity, sulphuric acid may be substituted, if that can be got at a sufficiently cheap rate; but every kind of iron pyrites containing copper will, therefore, be available, to much greater advantage, and a large quantity of sulphur likewise obtained in addition. In this process the iron pyrites serve for two objects—1. To bring the ores containing copper into a state soluble by water. 2. To produce sulphuric acid gas, which is used to extract the copper from the solution in water. We, of course, a large plant, with abundant supplies of low copper ore, would enable the operations to be extended in proportion. The iron pyrites there cost about 35 skilling per barrel, and a cubic fathom of wood may be had for 82s. Coal is much more desirable for fuel, but wood is used there on account of the works being inland, and its great abundance. In old mines, where large burrows of low-quality copper ores have accumulated, all the iron will here be saved, and a much purer copper is obtained than that now procured by the use of iron. Mines of iron pyrites, containing copper of 1 per cent. and under, will pay well, if the expense of mining is not too great. Iron pyrites, with about 1 per cent., can be obtained at the rate of 1s. per barrel; the cost of reducing is only 4s. skilling, and 1 per cent. of copper in a barrel of iron pyrites represents a gross value of 8s.

It must be borne in mind that, in giving the above details, we are not furnishing calculations, but the absolute data of the expenses that have been incurred in carrying out the process to a successful issue. The works are a considerable distance inland, subject to many disadvantages, so that, probably, under more favourable circumstances, operations might be carried out on a more reasonable scale. It will be remarked that coal is considered a cheaper and more desirable fuel than wood, but that owing to the carriage from a distant seaport, through a mountainous country, its use is not available there. Judging from the cost of reduction in Norway, which is the scale here given, it would appear that, in a more favourable locality, the process could be conducted more advantageously. There are unquestionably many poor mundic ores in England and Ireland, which will not pay the present dressing charges, where this mode of rendering them available might be employed with benefit; under any circumstances we should think that it is worthy of a trial here. Some prejudice has hitherto existed with regard to the introduction of any experimental processes, on account of their being in too many instances merely based upon visionary theories, substantiated by laboratory results. In this case the objection does not apply, as the operations are now being carried out, and can, in the course of a few days, be seen by any one who will visit the works. The cost of expenditure has been ascertained there, and from that correct estimate can be deduced what it would be in any other locality where it might be found advisable to adopt it.

It is needless for us to add, that we are unable to give any definite opinion as to its real merits, but emanating, as it does, from a practical source, utilising what has hitherto been unprofitable, we have deemed it of such interest, as to draw the attention of all those concerned in the mining and reduction of copper ores to it. Should it not be applicable in the limits of the United Kingdom, it may be of utility to the British mining adventurer, either in the colonies or elsewhere abroad.

#### THE MINING AND INDUSTRIAL INTERESTS OF CORNWALL.

[FROM OUR CORRESPONDENT IN WEST CORNWALL.]

MARCH 4.—A fair amount of business is doing in mining shares, and the purchasers appear to be mostly people who are buying for permanent investments; thus showing the confidence of the public in the sound and healthy condition of mining undertakings. More shares, perhaps, have lately changed hands in tin than in copper mines. The declining standard during the last month, although not to any serious extent, still had some effect upon the business in copper mines; whilst the exceedingly high price of black tin, frequently ranging from 80l. to 90l. per ton, had a strong influence in stimulating purchasers in tin mines, especially in some which were in an improving condition. Meanwhile the demand, both for tin-plates and unwrought tin, is increasing, and opening up a prospect of augmenting prosperity for the numerous tin mines of West Cornwall.

The copper standard last week, Feb. 26, was firm, especially for the good parcels, and taking the average of the ticketing, there was an advance of about 1s. per ton. This, however, could scarcely be considered an advance, because the ores selling the previous week were those of the eastern and Devonshire mines, which generally sell at a lower standard than the ores of the western mines. At the same time, it was satisfactory to find that the standard was so firm last week. Some of the parcels of South Caradon, South Crinnis, &c., made a very high price, and Grambler and St. Aubyn ores, 58 tons, averaged nearly 23l. per ton. The following will exhibit the extent to which the standard declined during Feb.:

	Tons.	Amount.	Standard.	Produce.	Price per ton.
Feb. 5.	3827	£27,724 1 0	6160 18	64	£7 3 0
12.	4836	36,172 15 6	154 10	84	7 9 8
19.	5266	32,470 0 0	156 19	85	6 3 0
26.	5503	23,739 16 0	153 16	64	6 16 0

The standard was 7l. 2s. lower on Feb. 26 than it was on Feb. 5, and this made a decrease of 9s. per ton of ore. The standard has now receded to nearly the same position it was in at the last sale in December, and which at that time was considered so very advantageous, as compared with the close of the preceding year. The present price of copper ore is indeed very satisfactory, it being about 1l. per ton beyond what similar parcels would have made at the end of Feb., 1856; and, on that calculation, the ores of the United Mines sold last week for 756l. more than they could have realised this time twelvemonths. As to the smelters, those gentle-



men's profits have been advancing during the past month, as the following will show—

	Copper ore.	Cake copper.	Smelters' amounts.
Feb. 5.	£112 10 0	£135 0 0	£118 7 0
12.	112 10 0	135 0 0	122 1 0
19.	108 11 0	135 0 0	126 9 0
26.	109 8 0	135 0 0	125 12 0

So that whilst the smelters have been keeping up the price of fine copper to the manufacturers, they have been diminishing the price paid for ore to the miners, and have thus increased their own margin, for charges and profits, from 187. 7s. per ton, on Feb. 5, to 251. 12s. per ton on the 26th—a tolerably good increase in 21 days. Still the miners do not complain of present prices, which are well remunerative to copper mining; but they think the smelters have now quite enough per ton to reimburse themselves and get rich upon, without lowering the standard any further, at least whilst the present price of fine copper is maintained. There is some expectation of a new smelting company being established as soon as the money market becomes more favourable for such an undertaking. More competition in this trade is certainly wanted; in fact, there is at present scarcely any competition to be much regarded.

It is to be regretted that emigration still continues on so large a scale from the west of Cornwall. Good wages are given, and there is abundance of employment; in some parishes, indeed, miners are even scarce. The working miners are not emigrating because they are less comfortable at home than they once were; but from a restlessness of spirit, and a desire to better their condition, induced by letters they receive from relatives and friends in Australia and America. At the same time the facilities now offered by the Government for emigration, and the small amount it costs to emigrate, place it within the means of a great many of the working miners. It is thought by some that this system is carried somewhat too far by the Government, and that we shall soon have reason to regret that so much of the strength and sinews of our young working population has left us. A similar complaint is made by the agriculturists of the county. At ploughing-match meetings recently held, and reported in the local papers, some of the leading farmers have regretted that emigration is depriving the county of large numbers of its best labourers.

Recent advices from the manufacturing districts tend to dispel the fears of some gentlemen who thought the temporary slackness of the demand for copper would have induced a fall in the price of fine copper. It is now represented that business has greatly improved in the metal trades within the last week or ten days, and that both foreign and country orders have come in to a satisfactory extent. As the money market has also an improving tendency, it is believed we shall soon have a very brisk spring trade, and an increasing amount of business in mines. At South Frances account, on Monday, a dividend of 10s. per share was declared, and the balance increased, after a considerable sum was allowed for new machinery, &c. The credit for ore sold in Dec. and Jan. amounted to 94747.; at the previous account the ore sold amounted to 87587., an increase at the meeting last Monday of 7161. Wheel Buller is looking promising for a good mine again, and shares have been advancing. Wheel Basset shares are from 285s. to 295s.

Alfred Consols maintain a tolerably steady price, at about 221. Copper Hill is stated to be looking well; the account was held on Tuesday, for four months, ending January, and showed a balance of 821. against the mine, but no call was deemed necessary; the loss on the four months was only 2961. The neighbouring mine, East Basset, is said to be looking not quite so well. In Cook's Kitchen some shares have changed hands; it is thought that in depth a fine deposit of tin will be discovered, as was the case in the adjoining mine, Dolcoath. Condurrow, 1584. West Basset are firm at 351. and upwards. West Stray Park is considered to have fair chances of success. At South Wheal Ellen, on Tuesday, a call of 12. per share was made, to pay off all back liabilities for machinery, &c., and to provide for further prosecution. Wheal Kitty (St. Agnes) is doing well, and so are many other tin mines; if they do not flourish now, with tin so high, they can never be expected to succeed. At Great Work account, a dividend of 7. 10s. per share was declared. East Margaret is a promising mine. Great Howas, after much struggling, seems at length to be making satisfactory progress.

The Mines Rating Committee has resumed its labours, but these labours are likely soon to be cut short by a dissolution of Parliament, in which case it is rather improbable that all its members will be sent up again to the House by their constituents. The signs of the times are already discerned by some of the hitherto advocates of the rating; and it is pretty well understood that there will be a falling off of some influential gentlemen from the ranks of those who have so blindly supported the rating measure. It is sufficiently clear that gentlemen who wish to rate mines will not receive the support of the mining adventurers, agents, and miners generally, in East and West Cornwall. Should an election take place, the sentiments of the great majority of the mining interest ought to be strongly and decidedly manifested on this subject.

#### REPORT FROM YORKSHIRE, DERBYSHIRE, AND LANCASHIRE.

[FROM OUR CORRESPONDENT IN CHESTERFIELD.]

MARCH 6.—There has been no material change in the present position or future prospects of the Iron Trade. The demand for home consumption is satisfactory, and the prospects of a very active summer trade appear pretty certain, if only half the foreign contracts come into the English market, which are confidently expected. The orders now in the hands of the ironmasters, are of a nature to enable them to carry on a tolerably active trade for some time. The demands for Scotch pig-iron are considerable, and business has been done at an advance.

A mineral railway, the North Yorkshire and Cleveland line, was opened on Tuesday last, and it may be regarded as very important to the mineral interests of North Yorkshire. The line was required to convey the vast quantities of mineral from the Cleveland hills to the extensive ironworks in Durham and the surrounding districts, and there can be no doubt, that the traffic in ironstone will be a great source of income to the company. The ironstone at Eton is said to contain 33 per cent. of iron, and that of Cleveland 38 per cent. Several other short lines are forming, so that during the present year it is probable that the district of Cleveland will be well supplied with railway accommodation.

The eminent services of Mr. Edward Pease, of Darlington, are about to be recognised by the people of that town, by the presentation to him of a testimonial. Mr. Pease was the chief promoter of the Stockton and Darlington railway, which has greatly contributed to the prosperity of the town. A meeting of Sheffield manufacturers took place on Tuesday, to consider the advisability of establishing a Chamber of Commerce in that town. Mr. Vickers occupied the chair: it was stated that Sheffield was labouring under a great disadvantage in not having such an association, and a resolution was passed to provide a Chamber of Commerce forthwith. The president and officers are elected to all the preliminaries arranged for putting the institution in working order.

There has been no alteration in the Coal Trade since my last, except that the demand is less active. Colliers (of the Irish class) are more plentiful than they were, but this is generally the case in the winter season. The unfortunate catastrophe at Lund Hill, near Barnsley, continues to excite great sympathy throughout the country, and the scene of the fatal calamity is visited by great numbers of persons far and near. Little prospect remains of extricating the bodies this week. Since our last, the shafts have been opened, and a continuous stream of water poured into the pit at the rate of 100 gallons per minute, but the fire, as indicated by the temperature of the pit, is not yet extinguished.

A shocking accident happened on Wednesday morning, by an explosion in the hard coal, at the Shipley colliery, the property of Mr. A. M. Mundy, of Ilkstone, by which five men and boys were killed, and twelve seriously burnt. There is excellent ventilation and every arrangement at the works to ensure safety, and on the morning of the accident, the deputy had examined the workings and found no trace of gas. By a lucky chance, Mr. Hedley, her Majesty's Inspector for the district, was inspecting a neighbouring colliery at the time of the accident, and heard of it when he was underground. Mr. Hedley hastened to the scene of the explosion immediately, to give the managers of the colliery the benefit of his valuable assistance and judgment in such an emergency, and he arrived at the site of the explosion before all the bodies were sent out of the pit. After seeing that those whose lives had not been wholly sacrificed, were attended with all the aid which medical skill could afford, he proceeded to make a very careful examination of the pit where the explosion had occurred, and he found that the ventilation continued in its original course, uninterrupted, and that the explosion had scarcely left any trace of its effects behind it. The primary cause of the accident he discovered to be the explosion of a quantity of gunpowder, which had been ignited by a spark from a workman's candle near the wall face; the concussion of this brought

the gas out of the works upon the workmen's lights. Mr. Hedley was indefatigable in his exertions to ascertain that the wounded men had every possible attention paid to them to promote their recovery, and he visited them personally to see that his instructions were carried out. He found that one of them had set aside the lotion sent by the medical officer, and was applying turpentine to a poor fellow's burns. He took away the stuff to prevent its being used again. An inquest was held on Thursday, at Cotmanhay, on the bodies, and adjourned, an order to have the evidence of some of the injured men.

In our last communication we stated, that North Derbyshire Mining Company's 2s. extension shares had been taken up, and that 10s. premium had been refused, but by a mistake of the printer 10s. was printed as 107. The operations of the company are going on most satisfactorily, and the pumping machinery will be in operation shortly. The Eym mine is looking well, and the shares have got up to 361. ex div. 5s. paid. The Chapel Dale Mine, 6s. paid, are quoted at 16s. premium. The Brightside with 35s. paid are realising 58s. These and other indications of successful mining in the Peak might be adduced if it were necessary.

#### THE IRON AND COAL TRADES OF STAFFORDSHIRE.

[FROM OUR CORRESPONDENT IN WOLVERHAMPTON.]

MARCH 4.—The Iron Trade presents no remarkable feature to distinguish this week from those which have immediately preceded it. The principal manufacturers are well supplied with orders, and their works are in general in full operation. The smaller makers are perhaps hardly so well off as they were, and the demand for bars is said to be rather less active, but, on the whole, the trade appears to be in a sound and healthy state, while signs of improvement in the general hardware trades indicate the probability of an increased home consumption, if this be not temporarily checked by the uncertainty caused by the probable dissolution of Parliament, consequent upon the defeat of the Government on Tuesday.

As the season advances, the demand for coal for domestic purposes naturally declines, but this does not affect the demand for the ironworks, which is very considerable.

On Monday, there was a meeting of the creditors of Messrs. Fox and Henderson, at the Birmingham Bankruptcy Court, for the choice of assignees. The following were appointed trade assignees without opposition:—Mr. Joseph Robinson, iron manufacturer, London; and Mr. Charles Lloyd Browning, of Harborne, Staffordshire, ironmaster; and Mr. James T. Chance, Brown's-green, Handsworth, glass manufacturer. The inhabitants of Smethwick, where the works of the firm are situated, are naturally extremely anxious that the extensive works of the firm should continue to be carried on, otherwise it will be a serious blow to the town, which has but very recently been brought under the provisions of the Public Health Act.

In the *Mining Journal* of Saturday last, there appears a letter from Mr. Richard Cort, containing some strictures upon the recently published little work of Mr. Joseph Hall, entitled "The Iron Question;" those strictures, incidentally glancing on myself, as having in a notice of the book endorsed Mr. Hall's claims to be the inventor of the "puddle-boiling process," and of the accessory inventions necessary to carry out that process in a successful and profitable manner. As Mr. Cort states, I have received copies of the specifications of Mr. Henry Cort's patents, dated 1783 and 1784, and have also received (from some source) a copy of a review of Mr. Hall's book which has appeared in the *Mechanics' Magazine*.

After an attentive perusal of all these papers, I am compelled to say that the opinions I expressed in my notice of Mr. Hall's book of his merits, as the inventor of an improved method of manufacturing iron, remain unchanged. Those opinions were not expressed until I had made careful enquiry on the subject, and a little consideration will I think suffice to convince any unprejudiced mind, that the arguments relied upon in opposition to Mr. Hall's claims, entirely fail to sustain the conclusions sought to be based upon them. With respect to the review in the *Mechanics' Magazine*, which assumes as an established fact, that Welsh iron on an average fetches a better price than Staffordshire iron, and that no man can claim to be an inventor, who does not first get his claims endorsed by the Patent Office, or announced in the columns of a newspaper, it may be at once passed over, as its arguments cannot possibly raise a question in the mind of any person at all conversant with the question at issue.

Before referring to Mr. Cort's letter, I most distinctly say that I do not for one moment seek to detract from the great and unquestionable merits of the late Mr. Cort, or to diminish in the slightest degree the strength of that claim which his descendants have upon the country, to which his inventions have proved of such extensive benefit. I will go further, and say that I do not agree with Mr. Hall when he says, that "Mr. Cort had not the most distant claim to merit in the invention of his puddling process." I certainly think that for the invention of his puddling process, he has great claims to merit, inasmuch as that invention, imperfect in itself, was the first great step to the processes now in use, and on which the great expansion of the iron manufacture, with all the advantages to civilisation which its increased supply occasions, depends. In saying this, however, I may add, that I believe few men are more disposed to recognise Mr. Cort's claims than Mr. Hall, who has not been backward in giving substantial expression to that recognition of the value of Mr. Cort's inventions.

Mr. Richard Cort maintains, that his father had discovered the process of puddle-boiling, because, in his specification of 1784, he claims to have invented the process of making malleable iron from pig-iron in an air furnace, without the use of a refinery or blast, and also, because in describing the process he says, that after being for some time exposed to the operation in the air-furnace, "an ebullition, effervescence, or such like intestine motion takes place;" the terms italicised proving, as he contends, that by the method invented by the late Mr. Cort, the metal was actually boiled as at the present day.

With respect to the first argument, that Mr. Cort claims to effect the conversion of pig-iron by a single process, it may at once be replied that the insertion of a claim in a specification can never be admitted as evidence that the result was really attained for practical purposes by the inventor. Mr. Bessemer claims to produce malleable iron from pig-iron by a single process, without the employment of manipulation or fuel, and because this claim appears in his specification, it is to be said that any future patent inventor who may hereafter achieve this result, in whole or in part, will be entitled to no claim to merit for his invention, because Mr. Bessemer had previously specified a patent for the accomplishment of the same object? If the claims of patentees were in all cases represented by corresponding practical inventions, what extraordinary wonders would human ingenuity have achieved, and how rapid would be the progress of the human race in the arts of civilisation. Mr. Cort's specification not only claims for making iron from the pig, but equally, and first in order, "for preparing, manufacturing, and working of iron from the ore," and it is to be said that this has been yet accomplished by any practical process of puddling without the use of "any blast?" To ascertain what any inventor has really achieved, we must look to the practical results, and not to the claims inserted in his specification.

With respect to the expression employed in the specification, that "the whole of the above part of my method and process of preparing, manufacturing, and working of iron is substituted instead of the use of that fiery," a little enquiry will show that this cannot possibly refer to the refinery, which the process of "puddle-boiling" dispenses with, and the origin of which is subsequent to the time of Mr. Cort. Before he invented the process of puddling, pig-iron was converted into bar-iron by means of a refinery, in which charcoal was used as the fuel, and a blast was employed. Through this refinery the iron had to pass twice, and sometimes three times, according to Scrivenor, before it was sufficiently malleable to be worked. It was this refinery which Mr. Cort's method of puddling was to be a substitute for, and not the refinery which was subsequently introduced by Mr. Samuel Homfray, of Pen-y-darraig, in South Wales, in order to carry out that process effectually.

With respect to the terms "effervescence and ebullition," they are perfectly applicable to the "dry puddling" process, in which there is distinctly a bubbling of the iron, to which those expressions might be not improperly applied, but which in degree is palpably different from what appears in the process of "puddle boiling," in which the metal and the cinder form a thin liquid mass, which boils up, until it occupies twice the space it would fill when cold.

Mr. Scrivenor, in his *History of the Iron Trade*, published in 1854, describes Mr. Cort's process of puddling, and speaking of the iron when raised to the greatest heat during that process, says—"The hottest part of the iron now begins to heave and swell, and emit a deep blue lambent flame, which appearance is called fermentation;" and after the process has proceeded somewhat longer, "the iron," he says, "is at length brought to the

consistency of sand;" a description which cannot possibly be mistaken for the boiling process; whilst what he terms fermentation might, without any straining of language, be described as "ebullition, or effervescence." He goes on to state that this process was found not to succeed until Mr. Homfray adopted the plan of first melting the pig-iron in furnaces by coke, which is the process Mr. Hall claims the merit of dispensing with. Although Mr. Scrivenor only slightly alludes to the process of "puddle-boiling," and does not appear to have very correctly estimated its importance, he distinctly recognises it as a process distinct from, and subsequent to, not only the discovery of puddling by Mr. Cort, but also the adoption of the refinery, which was necessary to render Mr. Cort's invention practically available.

One other consideration tends to establish the same conclusion. The process of "puddle-boiling," on account of the extreme heat to which the metal is raised, cannot be conducted in the furnaces which were in use long after Mr. Cort's death. The sand bottoms of those furnaces, as well as the sides, would be destroyed by the excessive temperature attending that process; and Mr. Hall's great difficulty in carrying out this system arose from the necessity of constructing a furnace which was capable of withstanding the effects of the great heat connected with this process. Yet Mr. Cort's specification says not one word about any improvement in the construction of the furnace, which is an essential element in the successful adoption of this process.

To sum up the question in a few words, it appears that Mr. Henry Cort invented the process of puddling, which he believed to be sufficient to effect the conversion of pig-iron into malleable iron, without any other process, but experience proved that this method was in itself unsatisfactory, until an intermediate process, to which the old name of refining was applied, was introduced; and this double process, effected by the refinery and the "dry puddling" furnace, prevailed for many years, until Mr. Hall, by dint of careful observation, sagacious experiment, and unflinching perseverance, succeeded in realising Mr. Cort's original idea of producing malleable iron direct from the pig by a single process of puddling.

It is within the range of possibility that Mr. Cort did, to some extent, adopt the "puddle-boiling" process, and it is very probable that his perseverance and ingenuity, had he lived, would have enabled him to have overcome all the obstacles to the practical realisation of his idea; but it is perfectly clear that the invention, as he transmitted it to the country, required the refinery to supplement it, in order for it to be of extensive practical benefit, and that the full realisation of his conception required another inventor whose merits would only be second to his own.

To this merit Mr. Hall lays claim, and a very different class of facts and arguments to those advanced by Mr. R. Cort must be adduced before his title to that degree of merit can be invalidated.

#### INDUSTRIAL PROGRESS ON THE CONTINENT.

[FROM OUR PARIS CORRESPONDENT.]

MARCH 3.—The improved tone of the market generally is still maintained, and has given rise to a desire among some of the masters, especially those in the Champagne districts, to raise the prices. At the next meeting, there is reason to believe this question will be discussed. There can be no doubt but that within the last few days the demand has approached nearer to an equality with the rate of supply than hitherto, but there is a very general opinion abroad that it would be most impolitic and dangerous to the true interests of the ironmasters if at the first blush of returning healthiness to the metal market they were to raise their prices. If, for instance, the Champagne ironmasters adopt an increase, they must be supported by those of other districts, and then will have to sustain an active competition with other sources of supply. Pig-iron, moreover, can scarcely be said to be anything more than firm, for although the quotations last given are kept up, very little business has been done, and that little at the lowest figure—165 frs. For the second melting the price is better and firmer, at 185 frs. Castings are without any sensible variation; plates, 205 frs. to 210 frs.; gutter pipes, 280 frs. to 285 frs.; axle boxes, weighing 5 kilos, and over, 265 frs. to 275 frs.; ditto, weighing less, 370 frs. to 380 frs., all at the nearest railway station to the works; rods, 400 frs. to 420 frs. for No. 21, and 430 frs. to 440 frs. for No. 20. Nail-iron has risen 2 frs. above the tariff agreed upon last January, 590 frs. No. 18, and 54 frs. No. 20. Chain, 750 frs., mixed numbers. Copper is quoted—Russian at 3450 frs. to 3650 frs.; and Chili, 3300 frs. the ton. Tin—Banco, 4050 frs. to 4100 frs.; English, 4005 frs. to 4050 frs. Lead, 690 frs. to 700 frs.

The following are the Custom House returns for January:—			
Name.	Imported.	In bond.	Customs dues.
STEEL—bars	m. q. 608	—	Fr. 20,403
COFFER—English	3,104	—	—
Chili	1,659	1,258	10,769
Other countries	1,113	—	—
TIN	3,370	2,453	9,034
Iron—bars and rails	27,679	—	43,792
Pigs, English	65,332	—	—
Ditto, Belgian	16,693	114,099	368,883
Other countries	5,187	—	—
LEAD	33,515	45,446	87,987
ZINC—Zollverein	2	—	—
Belgium	6,508	—	—
Hanseatic Towns	11	514	4,021
Other countries	3,626	—	—
NITRATE or POTASH	9,715	450	11,664
NITRATE of Soda	17,413	33	17,948
COAL—Belgian	1,320,483	—	—
English	954,501	—	—
Zollverein	577,960	—	567,418
Other countries	12,955	—	—

#### MINING AND COMMERCE IN THE UNITED STATES.

BOSTON, FEB. 16.—In Mines, transactions continue limited. Owing to the recent extraordinary rise in copper in the English markets, prices of the best class of mining shares were held here, for a few days, for advanced prices. It was soon ascertained, however, that the movement on the other side was entirely artificial; and that the demand for ingot copper in the United States was no greater than the supply. Hence at the close of the past week there has been more disposition to realize fair prices for the better class of stocks. It is nearly thirteen years since the commencement of mining operations by organized companies at Lake Superior. Notwithstanding but two mines have as yet paid dividends, public interest in the adventures in that region is constantly increasing, so that skill in the economical management of every department of mining is sure to follow year by year. But while it is quite probable the mistakes in American mining have been, relatively, as few as those made in older countries, we have neglected many wise and rich results, which would have placed us much sooner on the road to remunerative results. It was ascertained, for instance, long since, that many of the mines must depend for profits on stamp-work; and yet up to this very time but a single mining agent ascertains, monthly, the exact proportion of copper in a ton of stamp-stuff, and knows to a grain by accurate analysis the value of the material he sends to market. There has been, in the aggregate, no deficiency of capital, but a waste of it in distributing it over the districts remote from navigation, and almost inaccessible for transportation, except in the winter season. In a word, there has been, in an eminent degree, the same lack of good judgment and good management that proverbially characterizes the operations of joint-stock companies. The former success of the leading manufacturing corporations of New England may be, in a good measure, attributed to a mutual acknowledgement of a harmony of interests. Discoveries, inventions, and improvements made by one were for the benefit of all. The mining adventures of Lake Superior require, on the part of every man interested, a similar acknowledgement. Every discovery in the geology of the district, every improvement in machinery, and every new method in details of mining, should be communicated without delay to every location. Uniformity of wages, freight, and prices of supplies, as far as the nature of such matters permits, should everywhere prevail. To this end, shareholders should insist on periodical meetings of the managers of the mines, and they should allow no man to hold a responsible position who is not willing to be taught by the experience of others.

The amount of copper raised from the mines at Lake Superior, during the year 1856, has not been ascertained. Nor can it be exactly estimated. Many of the mines allow their stamp-stuff to accumulate through the winter, undressed, being satisfied that the delay of preparation for market is more than compensated by the saving of fuel, and by devoting the same amount of labour to the opening of the mine for stopping in warmer weather. The figures below are partially estimated, but are probably less than the truth. They do not show the relative increase of product, but only the increase of shipments in 1856 over 1855. 178 tons shipped from Ontonagon in 1856 were known to have been left over at that port in 1855. And undoubtedly more or less of the shipments from the other districts in 1856 were indebted to 1855. The navigation last year was prolonged to a later period than usual, allowing, up to Nov. 15, at least, the clearing out of all the copper prepared for market. From tables prepared by Mr. Brunschwiler, of Ontonagon, and by Capt. Paul, of the North American Mine, and from official statements, we learn the shipments of rough copper for 1856, were:—Ontonagon: Adventure, 145; Asie, 35½; Double Houghton, 9; Evergreen, 19½; Flint Star River, 2; Forest, 50; J. R. Grant, 2; Mass, 18; Merchant, ½; Minnesota, 158; National, 115; Nebraska, 33; Norwich, 116; Ohio, ½; Ohio Trail, 4½; Peninsula, 4½; Ridge, 62; Rockland, 199½; Toltec, 60; Windsor, 22=2767 tons. From Keweenaw Point: Central, 53; Cliff (Pittsburgh and Boston), 154½; Connecticut, 22; Copper Falls, 154; Fulton, 2; North American, 323; North Western, 15; Phoenix, 11=2128 tons. From Portage Lake: Isle Royale, 223; Huron, 23; Pewabic, 96; Portage, 101; Quincy, 20=462 tons. The total shipments in 1855 were from Ontonagon, 1384; Keweenaw Point, 2345; Portage Lake, 313=4544 tons. CLIFF MINE had, on Jan. 1, 1857, at work 6 engines=209½ h.p., and 24



heads of stamps, which is the most powerful machinery on the Keweenaw Point, the total in that district being 30 engines—551 h.p. and 163 heads of stamps. In the Ontonagon district there are 16 engines—501 h.p. and 140 stamps. Of these Minnesota has 4 engines—153 h.p. and 12 stamps. At Portage Lake there are 6 engines, 52 h.p. and 130 heads of stamps. The aggregate cost of the steam-engines is estimated at \$38,700. Of the 36 at Keweenaw Point, three are portable engines. At Copper Falls, the stamp heads are put down as 60, while two of them (Hall's machinery) are actually equal to 50 of the old style. Each stamp head should pulverize 2000 lbs. of rock under pressure in the manufacture of glass, iron, and other metals.—J. RYLANDS, Warrington: Announcing wire.—D. L. PAIRCE, Besenfort: Electric apparatus for giving signals, and appliances connected therewith.—W. CLARK, Chancery-lane: Manufacture of sheet glass.—J. LOMB, W. SPOTHILL, Rochdale: Steam-boilers for the more effectual consumption of smoke, whereby a great saving of coal will be effected.—H. Y. D. SCOTT, Brompton Barracks: Improved manufacture of cement.—W. OAKES, Stockton-on-Tees: Manufacture of iron.—E. EDWARDS, Wrexham: Manufacture of chains for cables and other purposes.—A. T. BLAKELY, Tunbridge Wells: Ordnance.—J. ELDER, S. HARTLEY, Manchester: Machinery for moulding.—J. WHITEHEAD, Preston: Boilers.—F. H. THOMSON, Glasgow: Manufacture of iron.—J. MINNOLSON, Hyde, W. STREY, Fairfield: Railway chairs, and in the joining of rails for railways.—W. FOOTMAN, Pentonville: Utilizing the illuminating properties of gas, by improvements in burners or shades or reflectors.—W. E. NEWTON, Chancery-lane: Improved furnace for locomotive and other boilers.—J. BETTLELY, Liverpool: Machinery for lifting and working anchors, cables, and other weights on shipboard.—A. PARKES, Birmingham: Separating tin from tin-plate scrap, and tin or zinc from other surfaces of iron.—J. FENTON, Low Moor: Method of connecting the feed pipes of locomotive engines and tender.—L. PRAND, South-street, Finsbury: Ventilating and preventing inundations in coal mines.

## WEEKLY LIST OF NEW PATENTS.

GRANTS OF PROVISIONAL PROTECTION FOR SIX MONTHS.—D. V. STEWART, Glasgow: Moulding or manufacturing cast-iron pipes.—T. NEWCOMB, Fockham: Machinery for manufacturing nails.—A. PARKES, Birmingham: Manufacture of nails.—T. WITTEKALL, Manchester: Manufacture of copper, brass, or other metallic rollers or cylinders.—C. DE BARON, Downgate-hill, London: Marine steam-engines.—J. GREEN, Philadelphia, Pennsylvania, U.S.: Furnaces for burning combustible gases under pressure in the manufacture of glass, iron, and other metals.—J. RYLANDS, Warrington: Announcing wire.—D. L. PAIRCE, Besenfort: Electric apparatus for giving signals, and appliances connected therewith.—W. CLARK, Chancery-lane: Manufacture of sheet glass.—J. LOMB, W. SPOTHILL, Rochdale: Steam-boilers for the more effectual consumption of smoke, whereby a great saving of coal will be effected.—H. Y. D. SCOTT, Brompton Barracks: Improved manufacture of cement.—W. OAKES, Stockton-on-Tees: Manufacture of iron.—E. EDWARDS, Wrexham: Manufacture of chains for cables and other purposes.—A. T. BLAKELY, Tunbridge Wells: Ordnance.—J. ELDER, S. HARTLEY, Manchester: Machinery for moulding.—J. WHITEHEAD, Preston: Boilers.—F. H. THOMSON, Glasgow: Manufacture of iron.—J. MINNOLSON, Hyde, W. STREY, Fairfield: Railway chairs, and in the joining of rails for railways.—W. FOOTMAN, Pentonville: Utilizing the illuminating properties of gas, by improvements in burners or shades or reflectors.—W. E. NEWTON, Chancery-lane: Improved furnace for locomotive and other boilers.—J. BETTLELY, Liverpool: Machinery for lifting and working anchors, cables, and other weights on shipboard.—A. PARKES, Birmingham: Separating tin from tin-plate scrap, and tin or zinc from other surfaces of iron.—J. FENTON, Low Moor: Method of connecting the feed pipes of locomotive engines and tender.—L. PRAND, South-street, Finsbury: Ventilating and preventing inundations in coal mines.

UTILISING BLAST-FURNACE GASES.—Mr. W. Oakes, of Stockton blast-furnaces, has succeeded in overcoming the obstacles usually encountered, his process having been employed at these furnaces for the past two months and giving every satisfaction. These furnaces have seven boilers 50 feet long and four feet in diameter, which generate steam, without the use of coal, sufficient to supply blast to three furnaces. The furnaces have level and closed tops, with valves, by which they are fed. From the centre rises a flue, which receives the gas made by the smelted materials. The gas is received into a main flue and conducted under the seven boilers, when it is lighted, and generates more steam than the works require, effecting a saving in the use of coal of several thousand pounds a year. In previous attempts, in drawing away the gas from the furnaces, the heat has been reduced, and the smelting rendered irregular, by which the quality of the iron was made unequal and inferior, but by this process the heat is diffused equally in all parts of the furnace, and the best white iron is made—the sulphurous gases being all drawn away, rendering the iron purer than usual. The furnaces can be filled to the top, and a larger quantity of ore smelted than has usually been done at the same expense of blast.

UTILISING WASTE GASES OF BLAST-FURNACES.—Mr. H. Weissenborn of New York, U.S., has patented an invention which consists in the mechanical arrangement of a feeder in combination with a surrounding gas chamber, with an open bottom placed above the furnace throat, whereby the gas is prevented from escaping from the throat of the feeder, without being covered, but is forced into the gas chamber by the dense body of coal and ore always contained in the feeder, and therefore delivers a regular supply of gas which can be carried to any heating furnaces on the bottom ground of the blast-furnace with the same advantages as if applied on the top.

SUPERHEATING STEAM.—Mr. John Darlington, of Cannon-street (for a correspondent), has patented an invention for superheating steam. It primarily consists of certain regulator valves, by the use of which the degree of heat acting upon steam tubes placed in a heating chamber may be regulated, thereby modifying at will the intensity of the steam itself, which should never exceed a certain temperature; and finally, by the opening of which, combined with other means, the action of the superheating apparatus may be entirely suspended, thus leaving the steam to pursue its ordinary course between the boiler and the engine.

PATENT SAFETY CAGE.—Mr. Hugh Baines, architect, of Manchester, has patented an improved apparatus for preventing the fall of the cage. On the guide rods, one of which is placed at each angle of the cage, are racks, which remain inactive until the rope breaks, when a strong vulcanised india-rubber spring throws out levers, which catch in the teeth of the rack and safely suspend the load. This invention appears somewhat similar to, but less effective than, an invention patented by Mr. C. J. Emery, of Cobridge, described in our Journal of March 15 and April 5, 1856, and shown at the last exhibition of the Society of Arts.

A PURIFYING AND REGULATING GAS BURNER.—Messrs. Feaureau and Legendre, of Brussels, have just specified their patent (procured per Mr. Campin, the patent agent) for improvements in the purification and combustion of gas, which consist in a peculiar arrangement of gas burners, and the use of a purifying or filtering and regulating apparatus connected therewith, which may, however, be used with advantage apart from each other. Screwed to the gas pipe (and forming part of the burner) is a short tube, having a perforated disc plate, circumferenced by its circumference. To this is screwed the other part of the burner, which is another short tube, the interior of which acts as a receiver for the gas after it has passed through the before-named perforated disc or purifier, from which receiver the gas emerges through exit passages, which are placed opposite to each other, by the burner pieces, which are inclined towards each other, so that the flames issuing therefrom may be induced to cross each other, whereby, it is stated, more perfect combustion and great illuminating power, are obtained. The purifying or filtering plate will serve as a regulator, inasmuch as, by diminishing or increasing the size and number of its perforations, the flow of gas will be increased or diminished; and it will serve to arrest and strain off from the gas the extraneous substances passing through the pipes. The patentees propose using a top for the gas chimney, which is an annular perforated plate, with a pendant rim or flange to fit on to the gas flue.

THE REGULATING AIR-DOORS.—Since we published, among others, the testimonials in favour of Mr. Lee Stevens's Regulating Air-Door from the Commander and Chief Engineer of the *Perseus*, we have received the following extract from the professional report, under date of Feb. 12:—"The *Perseus* left Victoria Docks with air apertures closed (i.e. action of invention suspended), steam left in 20 minutes from 15 lbs. pressure to 13; smoke heavy for five minutes at each firing. Air apertures then opened; smoke suppressed in 30 seconds; and in ten minutes after adjustment of apertures steam blowing off at 15 lbs., and so maintained when pilot left at sea." This admirably built and fitted screw steamer has gone out to her station, between Rio and Pernambuco; and she is the first vessel of her class intended for the Brazilian coasting trade, which she is to undertake as the quotation given, we ascertain that her speed, with outward cargo on board, exceeded the contract rate; which is equally creditable to her builders (Messrs. Chas. Langley and Co., Deptford) and the manufacturers of her engines (Messrs. Summers and Day, Northam Iron Works, Southampton). In the same building yard we notice several iron steam ships in a forward state—one for passenger traffic between Copenhagen and Elsinore, a coasting screw for Norway, &c.; so that north and south, as well as east and west, preference continues to be given to the constructive skill of this country, in furnishing the means of marine intercourse and transit.

OSCILLATION IN LOCOMOTIVES.—Mr. W. M. Henderson, of the Union Works, Baltimore, submitted the following experience gained from experiments made in order to discover the cause, effect, and means of counteracting the evil. There are two forms of oscillation in locomotives—fore and aft, and lurching. The first is due to the inertia of the engine and the other part of the pistons, rods, and cross-heads, having the weight of the engine and the weight of the pistons, rods, and cross-heads counteracted, of which should be a proportionate weight moving in adverse directions to the motion of the engines, may be made in the form of a block working in slides, and driven by the return crank, producing a correcting antagonistic force, completely neutralising in its effect. The second form of oscillation is produced by the eccentric swinging of the cranks, and merely require to be balanced by equivalent weights in the driving-wheels. An engine correctly balanced in this manner will be found to run with astonishing ease and steadiness of motion, require at least 25 per cent. less fuel, and keep in running order an infinitely longer time.

RAILWAYS.—Mr. Alfred Krupp, of Essen, Prussia, cast-steel manufacturer, has provisionally specified some improvements in the permanent way of railways, which consist in forming the rails of railways of two distinct and separate parts, and making such parts of different metals, whereby he is enabled to form a rail that shall combine great strength and durability, while at the same time the cost is materially increased. The metals that it is proposed to use are cast or wrought-steel and cast or wrought-iron, and the parts are thus combined to form a rail:—The lower portion of the rail is formed of cast or wrought iron, of a shape similar to the ordinary flange rail. The upper surface of this portion of the rail is either formed with a groove, or a portion is cut away upon one side, or upon both sides, so as to admit of the upper surface being fitted thereto. This upper surface is made of either cast-steel or wrought-steel, or steel of any other kind that may be adapted for this purpose, the inventor preferring, however, to use cast-steel rolled to the required section and dimension. This superior surface is bolted or otherwise secured to the lower or iron portion of the rail. Rails constructed according to this method will be found practically applicable for railway stations where the wear and tear of the rail is so materially increased.

NORTHERN BENGAL RAILWAY COMPANY (Limited).—The object of this company is to connect Rajmahal, the northern station of the East Indian Railway, with Dinapore and Darjeeling, accommodating the districts of Rungpoor, Maldore, and Purneah. These lines will accommodate a country of great traffic, and vast resources. The lower country sends largely to Calcutta, for consumption and shipment, sugar, tobacco, cotton, hemp, jute, &c.; and in the upper country the production of copper and iron are being extended. The hill regions also produce coal and other mineral productions, and the railways proposed command the traffic to Assam and Central Asia. The directors are in communication with the Hon. East India Company, with a view to place this company upon the same basis as the other Indian railway companies, under a guarantee of a minimum rate of interest. Should this arrangement, which is regarded by the directors as an essential and indispensable condition, not be effected, the deposit of three shillings per share will be returned, less the expenses which shall have been incurred.

RAILWAY CALLS.—The amount falling due in March is unusually small, being only 495,975l.—360,000l. of which is for the Great Central of France Railway. The total called for the year is 2,180,222l.

GOLDENHILL, COBALT, NICKEL, COLOUR, BORAX, AND CHEMICAL WORKS, NEAR STOKE-UPON-TRENT, STAFFORDSHIRE.

JOHN HENSHALL WILLIAMSON, MANUFACTURER AND REFINER. Reference.—Professor Miller, King's College, London.

NICKEL AND COBALT REFINING, AND GERMAN SILVER WORKS, MILL STREET, BROAD STREET, BIRMINGHAM.—STEPHEN BAKER begs to inform the Trade that he has the following articles for sale:—REFINED METALLIC NICKEL. OXIDE OF COBALT. WIRE, &c. REFINED METALLIC BISMUTH. GOLDMAN'S IN INGOTS, SHEET, NICKEL AND COBALT ORES PURCHASED.

TO CAPITALISTS, AND OTHERS INTERESTED IN MINING.—To be sold, or worked in company, an extensive and rich GOLD FIELD, having a plentiful supply of water and timber; in an excellent climate, situated in New Granada, South America, which has cost the owner thereof £2500 sterling. A working capital of £500 will put the property in full order, and make the first washing! This being a bona fide concern applicants will please give proper addresses, with- out which notice will be taken. Address "Pagarita," Mining Journal Office, 26, Fleet-street, London.

TO CONTRACTORS.—SANDWICH BRIDGE.—The CORPORATION OF SANDWICH invite TENDERS from parties willing to CONTRACT for WROUGHT-IRON GIRDERS, and OTHER WORKS, forming an opening bridge over the navigable channel of the River Stour. Plans and specifications to be seen at Messrs. BIRCH'S, 3, Cannon-row, Parliament-street, on and after Thursday, the 12th inst. The Corporation do not bind themselves to accept the lowest, or any tender. Tenders, under cover, to be addressed to Town Clerk, Sandwich, and marked "Tender for Sandwich Bridge."

AGENCY WANTED.—A PERSON, whose connections are among the ironworks, collieries, &c., of this neighbourhood, would take an AGENCY for the SALE of ANY ARTICLE suited to this district, and which could be attended to by devoting two or three hours of the after part of the day.—Address, stating particulars, "A. O. Z.," Post-office, Wolverhampton.

DIRECTOR WANTED.—WANTED, a GENTLEMAN of distinction and influence to complete the BOARD of a LIMITED COMPANY, formed to work a mineral property of great value. State if a director of any other company, and what.—Address, "H. L.," Mining Journal Office, 26, Fleet-street.

TO MINING COMPANIES.—A GENTLEMAN of middle age, speaking the French, German, and Spanish languages, and having had many years' experience in SUPERINTENDING extensive LEAD and COPPER MINES abroad, to which SMELTING WORKS were attached, wishes for a SIMILAR APPOINTMENT. A liberal salary expected, as the highest testimonials can be offered.—Address, "H. H.," Mining Journal Office, 26, Fleet-street, London.

IRON FOUNDRY.—WANTED, a PARTNER in the above, who can command £500, to replace a retiring partner. The business is established, with a good paying connection, and the situation is everything that can be desired, railway and sea being within a short distance of the foundry.—Apply, "H. K.," Mining Journal Office, 26, Fleet-street, London.

TO IRONMASTERS.—WANTED, by a PRACTICAL MAN, a SITUATION as FORGE and MILL MANAGER. Unexceptionable references can be given.—Address, "G. V.," Post-office, Brierley Hill, Staffordshire.

TO IRONMASTERS.—WANTED, the MANAGEMENT of IRON BLAST FURNACES, by a person who has had considerable experience with blast furnace operations, both hot and cold. Having received a metallurgical and chemical education, he is capable of making the necessary assays and analyses. For all particulars as to terms and testimonials, which will be found satisfactory, apply to "H. G.," Mining Journal Office, 26, Fleet-street, London.

TO COAL PROPRIETORS AND OTHERS.—Mr. JOHN SMITH, of HEYWOOD, begs to call attention to his recently PATENTED IMPROVEMENTS in PUMPING, the advantages of which are, that the pump or pumps are to fetch water from below the level of the shaft caused by dip of the mine or faults, and in any direction, doing away with pump rods, &c.; to be worked by wire, hemp, tape, chain, or other ropes, conducted by pulleys from the winding or other engine to the place required.—For particulars, to see the machinery at work, apply to Mr. JOHN SMITH, Captain Fold Colliery, Heywood; or to the Hare Field Colliery, near Heywood, Lancashire.

WANTED, an OFFER for 50 West Wheel Virgin, 15 Carnarvon, 100 College Shares. Terms cash.—Address, "H. M.," Mining Journal Office, 26, Fleet-street, London.

WANTED, a SMALL SECOND-HAND HAND CRUSHER, complete, in good working order; size of rolls, say 6 to 8 in. diameter.—Address, stating particulars, price, &c., to J. GOVILL, 36, Cannon-st., London, E.C.

STEAM PUMPING ENGINE FOR SALE.—A 36 in. ROTARY ENGINE, in capital condition, with 10 tons boiler, TO BE SOLD CHEAP.—Applications to be sent before the 18th of March inst. to Mr. EDWARD KING, No. 27, Austin Friars, London.

STEAM PUMPING ENGINE WANTED, from 36 to 50 in. cylinder.—Address, stating age, maker's name, where situated, and price, to Mr. J. H. MURCHISON, 117, Bishopsgate-street Within, London.

WEST HAM DISTILLERY COMPANY.—SHARES BOUGHT AND SOLD in the above company.—Apply to Mr. LAWRENCE, No. 2, Room, 25, Foultry, London.

LEAD.—THE BEST PRICE GIVEN FOR LEAD ASHES, &c., and OLD LEAD, in quantity. FIG-LEAD (hard and soft) SOLD at LOW RATES.—ROUSELL and Co., Southwark Lead Works, Gravel-lane, Southwark.

THE ROTATING BUDDLE is the BEST LABOUR SAVING and MOST EFFICIENT APPARATUS for WASHING STAMPED ORES and SLIMES. It will do from seven to ten times the amount of work of any other apparatus in use, with the attendance of a boy only. A 6 ft. water-wheel will drive two of them, and it turns the ore out cleaner and leaves the waste free from ore. It separates tin from copper; lead from copper, black jack, sulphates of barytes; copper from any vein-stuff or matrix. May be seen at work daily at Driggitt Mines, near Calbeck, Cumberland.—For particulars and licenses, apply to DAVID ZENNER, patentee, Newcastle-on-Tyne.

ROYAL SANTIAGO MINING COMPANY.—The Directors hereby give notice, that they have made a CALL upon the shareholders of ONE FORTIETH part share, to be paid to the company's bankers on or before the 19th March next. The form must be delivered upon application at the office; and the certificates must be lodged at the same time, to have the payment endorsed thereon.—38, Broad-street-buildings, Jan. 19, 1857.

WEST WHEEL VIRGIN.—TWELVE SHARES FOR SALE in that valuable TIN MINE, replete with machinery, and under the present judicious management may shortly pay dividends; price 15s. per share.—Address, "A. Z.," Post-office, Buntingford, Herts.

GREAT SHEBA CONSOLS MINE.—ALL MERCHANTS and others having OUTSTANDING ACCOUNTS AGAINST this MINE are requested to SEND the same FORTHWITH, addressed to the Committee, at No. 32, duckersbury, London, E.C., that they may be examined and liquidated. They are further requested in future to send in at the commencement of every month their account of goods supplied to the mine during the month preceding, that it may be charged in that month's cost sheet; and merchants neglecting to comply with this regulation, will preclude themselves from a second order.

THE GOVERNOR AND COMPANY OF COPPER MINERS IN ENGLAND.—Notice is hereby given, that the ANNUAL GENERAL COURT of this company will be HELD at the London Tavern, Bishopsgate-street, on Tuesday, the 7th April next, at Twelve o'clock at noon precisely. In pursuance of the provisions of the Company's Charter, the following gentlemen will retire from the Court of Assistants, but being eligible for re-election, will offer themselves for that purpose:—John Harman, Esq., Lewis Harrop Haslewood, Esq., and William Ambrose Shaw, Esq.

The Transfer-books of the company will be closed on Tuesday, the 24th inst., to Tuesday, the 7th proximo, both days inclusive. By order of the Court of Assistants, CHARLES FREWER, Sec. 10, New Broad-street-mews, London, March 2, 1857.

GREAT WHEEL VOR UNITED MINES.—Notice is hereby given, that the QUARTERLY GENERAL MEETING of adventurers in the above mines will be HELD at their office, Gresham House, Old Broad-street, on Wednesday, the 18th March, at Two o'clock precisely. R. T. ALLISON, Sec. Gresham House, Old Broad-street, London, E.C., March 7, 1857.

TRELEIGH CONSOLIDATED MINING COMPANY.—Notice is hereby given, that the ADJOURNED MEETING, called for Tuesday, the 24th inst., has been FURTHER ADJOURNED until Thursday, the 26th day of March next. Two o'clock precisely. WM. NICHOLSON, Sec. 57, Old Broad-street, London, Feb. 18, 1857.

THE CARNARVONSHIRE SLATE COMPANY (LIMITED).—Notice is hereby given, that an EXTRAORDINARY GENERAL MEETING of the shareholders of this company will be HELD at the offices of the company, 5, Church-passage, Guildhall, London, on Wednesday, the 11th day of March inst., at Four o'clock precisely, for the purpose of confirming a resolution passed at an Extraordinary General Meeting of shareholders, held at the company's offices on Wednesday, the 4th day of February last:—That the company do raise a sum not exceeding £10,000, in such sums as the directors shall from time to time determine, upon debentures, bearing interest at and after the rate of £5 per cent. per annum; and that at any time before the said debentures become payable, the holders thereof respectively are to be at liberty to exchange them for shares at par, if any shares shall then remain unissued. By order of the Board, HENRY TARR, Sec. Offices, 5, Church-passage, Guildhall, London, March 2, 1857.

IMPERIAL BRAZILIAN MINING ASSOCIATION.—Notice is hereby given, that a GENERAL MEETING of the proprietors of the above association will be HELD at the London Tavern, Bishopsgate-street, London, on Thursday, the 9th day of April next, at Two of the clock in the afternoon precisely, for the purpose of considering the propriety of an absolute and entire dissolution of the said association, in pursuance of the Deed of Settlement of the said association in this behalf, and of coming to such resolution thereon as the meeting shall think proper. By order of the Court of Directors, JOEL HITCHENS, Sec. Winchester House, Old Broad-street, London, March 5, 1857.

MESSES. FULLER AND CO., 51, THREADNEEDLE STREET, LONDON, continue to TRANSACT BUSINESS in BANKING, MINING (both English and Foreign), RAILWAY, and every description of SECURITIES; and are in a position to BUY and SELL at the market price of the day. The present favourable opportunity to capitalists command special attention to mines, which are paying continuous dividends of from 15 to 25 per cent. There is a progressive character, judiciously selected, frequently rising in value 50 per cent. and upwards.

WANTED.—Alfred Consols, Bedford United, Condurrow, Devon Great Consols, Gouanema, Hington Down, Great Wheel Vor, Rhoswydol, Providence, South Box, South Cardon, South W. France, W. Treilway, Mary Ann, West Nant-y-Mwyn. FOR SALE.—Bedford Consols, Drake Walls, Dyrwyn, Cliffton and Wainwright, Calstock Consols, Cradock Moor, East Russell, Gwynon, Lady Bertha, W. Edward, West Russell, West Cardon. Office hours from Ten till Five o'clock.

UNITED STATES OF AMERICA.—DUPEE, PERKINS, and SAYLES, BOSTON, MASSACHUSETTS, BROKERS for the PURCHASE and SALE of STATE, CITY, and RAILROAD SECURITIES, MANUFACTURING and BANK SHARES, give particular attention to the MINING COMPANIES OF LAKE SUPERIOR, and furnish reliable information concerning them. [DUPEE, PERKINS, and SAYLES refer to the Editor of the Mining Journal.]

## IRON IN AMERICA.

The production of iron in the United States for the year ending June 30, 1856, as shown by the census, was—

	Tons.	Value.
Pig-iron.....	564,753	\$12,741,777
Castings.....	322,765	25,108,155
Wrought-iron.....	278,044	16,747,074

Total.....1,165,562.....\$54,604,005

The number of establishments producing this was 2190; capital employed, \$50,000,000; and a little over 57,000 hands. This yield the secretary regards as only a grain of sand on the sea shore when the resources of the United States are considered. A recent geological survey of Missouri, now one of the smallest iron states, says there is enough ore of the best quality within a few miles of Pilot Knob and Iron Mountain, above the surface of the valleys, to supply 100,000,000 tons per annum of manufactured iron for the next 300 years, and can furnish 100,000,000 tons of coal per day for the next 300 years. The necessity of working these unproductive resources, he goes on to say, is proved by contemplating the large imports of the last fifteen years. The census of 1850 shows that we made that year (ending June 30), \$54,000,000 worth of iron. During the same year we imported \$16,333,145 worth, which in 1851 had reached \$29,341,755, or more than half the produce of 1850.

You have heard frequently of the wonderful qualities of the iron made from ore found on Lake Superior, now being worked by several companies. Professor W. B. Johnson publishes the following results obtained by him in a series of experiments, on the comparative tenacity and strength of various kinds of iron:—

	Strength in lbs. per ton.
Salisbury, Connecticut.....	40 trials.....56,000
Sweden iron.....	4.....58,084
Pennsylvania.....	10.....58,400
English (Cable, bolt).....	5.....59,105
Russian.....	5.....76,069
Lake Superior.....	5.....89,583

Some of this Superior iron was recently tested here with a view to try its tenacity. A piece of rolled iron of the thickness of one's wrist was subjected to various processes, and after bending it across an anvil, twisting it in opposite directions, and employing upon it all possible force and skill, the experimenters acknowledged that they never before had met with iron capable of so stubborn a resistance. The fracture of the pig metal glazes like steel, and the fibre of the rolled bars is tougher than that of any other iron known. There is a great demand for the ore for mixing with inferior kinds, but the supply at present is very limited.

The stock of Scotch pig-iron is very light here, and the market is very firm at £36 six months for prime brands, with sales to arrive at this rate; parcels in store command £31. The stock of refined English bars is also light; they are held at \$65 to \$66, common bars are firm at \$57½, the supply not large. English sheet, 40 tons singles, sold to arrive at 3½ c. six months, now held at 3½ c., doubles at 4 to 4½ c., and triples 4½ to 4¾ c. Boiler plates moderately active, at 3½ c. six months; hoop-iron is dull, at \$72 to \$73 for common specifications; extra sizes in the same proportion.—Correspondent of Birmingham Journal.

THE IRON TRADE.—"Ironmaster," in to-day's Worcester Journal, says—"The trade is hardly so buoyant as it was at the early part of last month; still most of the manufacturers are pretty well off, and with the exception of one or two of the marked iron houses, the leading firms are fully employed. Both from America and Northern Europe orders are coming in, but there are more enquiries from the latter than we have had for months past for shipbuilding iron. The price of pigs is well maintained. Hot-blast mine iron of the best description for large purposes continues at from 4l. per ton for large parcels to 4l. 2s. 6d. for small ones; the stocks are not increasing either in cold-blast, hot-blast mine, or cinder pigs. The make of the district is very large, but still in consequence of other pig-producing districts finding a better market than ours, it is kept down. It would hardly have been believed a few years ago that Scotch pigs would ever have been worth as much f.o.b. in the Clyde as Staffordshire mine iron is at Wolverhampton, but such is the case at the present time. G.m.b. are fetching from 75s. to 75s. 6d. per ton, short weight, whilst iron of equal quality is from 75s. to 80s. per ton, long weight. Gartsherrie is at 75s. per ton, short weight. He would have been a bold man who had ventured in 1843 to have said that Scotch pig-iron would ever have seen such a price.

"I am almost afraid to approach the subject of 'wonderful improvements' in the manufacture of malleable iron and steel, after the storm raised by Mr. Bessemer; but I assure you I have seen both iron and steel which has been produced by improvements upon, and in addition to, Mr. Bessemer's process, which have convinced me that both can be made of first-rate quality. Of course, it must take time to bring about such changes upon a large scale, but that eventually they will be carried I have no doubt, and it is in such hands as will be able to carry it out to the utmost."

THE "NAUTILUS."—UNSUSPENDED DIVING-BELL.—At the Society of Arts, on Wednesday, a paper was read by Major H. B. Sears (late of the United States Army). "On appliances for facilitating submarine engineering and exploration;" the object being to introduce to the notice of the English public an American invention called the "Nautilus." It is described as an instrument "for overcoming many of the difficulties inherent to the nature of subaqueous operations; some of its advantages being that it is entirely independent of suspension, its movements are entirely dependent on the will of those within it, and without reference to those who may be stationed without; it possesses the power of lifting large weights, per se, and at the same time is perfectly safe, by common care, in its operations. The form of the machine is not arbitrary, but depends entirely on the nature of the work to be performed, adapting itself to the various circumstances attending any given position." The principle upon which the machine is constructed is an attempt to imitate the power of the little animal from which it takes its name. In addition to the chamber which the diver occupies are the chambers to correspond with those in the animal, and while these are filled with air, the displacement of water being greater than it is on a weight, it floats at the surface. The diver enters his chamber through a manhole at the top, which is then closed, either from the inside or outside. He has then portions walled off on either side, which form the air chambers above alluded to; these chambers are connected at or near the bottom by a pipe, which opens by a cock outwards to the external surrounding water. An opening in the bottom of the machine, of variable dimensions, is closed by a door or doors, which may be opened or closed at pleasure. The air chambers are likewise connected at top by a smaller pipe, which opens through the top of the machine, and to which opening is affixed a flexible pipe, with coils of wire spirally enclosed; it being thus in the power of the diver to admit water at the bottom of the air chambers and fill them, or to admit air at top, from the air-pump at surface, and expel the water, any depth may be attained at will.

NEW TUNNELING MACHINE.—Count de Cavour left Turin on the 2d for Genoa, to witness experiments with a machine invented by Messrs. Boncolleri, Grestani, and Grandi, for working a tunnel through the Alps.



# IMPORTANT NOTICE.—TO IRONMASTERS & CAPITALISTS.

The ADVERTISER has discovered a MINE of RED HEMATITE, and a MINE of ANGILOCEOUS ORE, in a position workable by level in each case, within 25 cts. per ton carriage of shipment.

To work the Hematite will want \$1000.

To work the Angilaceous will want \$500.

Samples of each are now lying with Mr. Tongue, 50, New-street, Birmingham, or inspection and arrangement.

## TO IRONMASTERS.—MAGNETIC IRON ORE.

The CATHERINE and JANE CONSOLS MINING COMPANY solicit OFFERS for CARGOES of the above-named ORE, put on board at Port Madoc, North Wales, or delivered at Cardiff, Newport, or at Saltern, on the River Dee. Subjoined is an analysis of the ore. The mine is situated in the Valley of Festing, about five miles from Port Madoc, and the Festing Railway passes through the property. An almost unlimited quantity of ore can be raised from the lode, which averages about 18 feet in width, and has been laid open for several hundred fathoms in length.

Samples forwarded on application to the secretary, Mr. E. S. Conn, 28, Clement's-lane, Lombard-street, London; or to the local agent of the company, Mr. A. B. Callander, Broadland, Penrhyn, Carnarvon, North Wales.

Analysis of Magnetic Iron Ore from the Catherine and Jane Consols Mine, near Port Madoc, North Wales.

Water	5.600
Peroxide of iron	57.490 (45.4 per cent. of iron.)
Peroxide of iron	22.700
Oxide of manganese	1.420
Silica	18.757
Lime	.714
Manganese	.946
Alkalies	1.700
Phosphorus	.500
Sulphur	.556
Alumina	14.400
Loss	1.817=100.000

From the small quantity of sulphur and phosphorus, from the total absence of any other injurious constituents, and from the good percentage of iron, we are of opinion that the ore is of a good commercial quality.

(Signed) Mr. M. Nod, Ph.D., F.R.S., F.C.S.  
JOHN MITCHELL, F.C.S.

## FOREST OF DEAN CENTRAL RAILWAY COMPANY.

FIRST CALL on the shares of this company, making, with the £1 deposit, £2 per share paid.—Notice is hereby given, that a CALL of TWO POUNDS per share on the shares of this company was made by the Board of Directors on the 28th of February, payable at the City Bank, London, on or before the 1st of April next.

By order, SAMUEL H. WAGSTAFF, Sec.

Offices, 38, Cannon-street, London.

## NORTHERN BENGALE RAILWAY COMPANY (LIMITED).

Capital £2,000,000, in 100,000 shares of £20, or 200 rupees, each.

Deposit 1s. per share.

DIRECTORS.

Sir GEO. BONHAM, Bart., K.C.B., late H. M. Plenipotentiary in China, and Governor of Hong Kong.—CHAIRMAN.

Sir MACDONALD STEPHENSON, Director of the East Indian and Oude Railway Companies.—DEPUTY-CHAIRMAN.

WILLIAM BORRADAILE, Esq., 20, King's Arms-yard.

ARCHIBALD BOYD, Esq., 115, Westbourne-terrace, Hyde-park.

ARCHIBALD CAMPBELL, Esq., Darjeeling.

SAMUEL RAWSON, Esq. (Messrs. Rawson, Sons, and Co., London; and Lach, Rawson, and Co., Calcutta).

Major-General G. B. TREMEREERE, late Bengal Engineers.

SECRETARY—Hyde Clarke, Esq.

SOLICITORS—Messrs. J. C. and E. Freshfield.

ENGINEER—T. R. Crampton, Esq., C.E., K.L.H.

The East Indian Railway is open to Ranagunge on the route to Delhi, and will soon be completed to Rajmahal. The object of the present undertaking is to construct a northerly extension to Dinapore and Darjeeling, accommodating the districts of Rangpoore, Malda, and Purneah. The total length of railway to be constructed will be between 200 and 300 miles, to be undertaken in sections, as the Court of Directors of the East India Company may direct.

The proposed lines will accommodate a country of great traffic, and vast resources. The lower country leads largely to Calcutta, for consumption and shipment, sugar, tobacco, cotton, hemp, rice, oil, seeds, &c., and in the upper country the production of copper and tea are being extensively carried on. Should this arrangement, which is regarded by the directors as an essential and indispensable condition, not be effected, the deposit of three shillings per share will be returned, less the expenses which shall have been incurred. The allottees will not be required to execute any deed, but will receive scrip certificates in exchange for the bankers' receipts, without incurring liability.

Applications for shares may be sent to the brokers, Messrs. SCOTT, CORMACK, and SCOTT, 16, Throgmorton-street, or to the company offices, No. 2, King's Arms-yard, E.C.; but no application will be considered, unless a deposit of three shillings on each share applied for is previously made to Messrs. OLIVY, MILLS, and Co., bankers of the company. The deposit will be returned if the application is not acceded to.

## BRITISH CHRONOMETER, WATCH, AND CLOCK COMPANY (LIMITED).

17, EASTCHEAP, LONDON.—G. PHILCOX, Patentee.

Capital £50,000, in 50,000 shares of £1 each, payable by instalments of 5s. each, at intervals of not less than three months.

PRACTICAL MANAGER—Mr. G. Philcox, 7, Stebon-terrace, Stepney.

SOLICITOR—J. P. Parker, Esq., 13, New Bow-street, London.

Application for shares and prospectuses to be made to the secretary, at the offices, 17, Eastcheap, London.

## EXPLOSION AT THE LUNDHILL COLLIERY.

At a PUBLIC MEETING of the inhabitants of the town and neighbourhood of Barnsley, held at the Court House, on Thursday, the 26th of February, 1857, for the purpose of considering what arrangements should be made towards providing a fund for the widows, orphans, and sufferers by the explosion at the Lundhill Colliery, on the 19th ult.

THOMAS TAYLOR, Esq., in the chair.

It was unanimously resolved:

That this meeting records its sympathy with all the sufferers by the frightful explosion at the Lundhill Colliery.

That a subscription be set on foot to raise a fund for the relief of the widows, orphans, and sufferers by this terrible calamity.

That a committee be appointed for the collection and distribution of the fund to be subscribed, with power to take such steps as they may think proper for carrying out the objects of this meeting.

In accordance with the above resolutions, the committee respectfully solicits the aid of the benevolent, towards the relief of the sufferers from this, the most fatal, explosion at any coal mine in England: 186 miners have perished, and 89 widows, and 190 orphan children, are left entirely destitute of the means of support.

Remittances may be made to the Wakefield and Barnsley Union Banking Company; the Barnsley Banking Company; or to Messrs. NEWMAN and SONS, secretaries to the relief fund committee.

## SUBSCRIPTION ALREADY RECEIVED:

The Lundhill Coal Company	£500 0 0
The Right Hon. Earl Fitzwilliam, K.G.	100 0 0
Joseph Locke, Esq. M.P.	100 0 0
A. F. W. Montague, Esq. Melton Hall	100 0 0
The Wombwell Main Coal Company	100 0 0
Messrs. Hirst, Dawson, and Hardy, Low Moor Ironworks	100 0 0
Messrs. Woodcock and Jackson, Derby	50 0 0
The Executors of Samuel Thorp, Esq.	50 0 0
F. W. T. V. Wentworth, Esq. Wentworth Castle	50 0 0
John Birks, Esq. Hemingfield	50 0 0
His Grace the Duke of Cleveland	25 0 0
J. C. D. Charlesworth, Esq. Hatfield Hall	25 0 0
Messrs. Thomas Taylor and Sons, Barnsley	25 0 0
J. W. Day, Esq. Felaw House	25 0 0
William Harvey, Esq.	25 0 0
J. S. Stanhope, Esq. Cannon Hall	25 0 0
J. S. Beckett, Esq. The Knoll, Torquay, Devon	25 0 0
Samuel Plimsoll, Esq. London	20 0 0
Robert Craik, Esq. Barnsley	20 0 0
Messrs. William Kaye and Son, Clayton	20 0 0
Sir B. Heywood, Bart. and Co. Manchester	20 0 0
Henry Richardson, Esq. Barnsley	15 0 0
William Walker, Esq. Wilsick	15 0 0
W. H. Peacock, Esq. Barnsley	10 0 0
Mr. Allen, Walsby	10 0 0
G. P. Nicholson	10 0 0
R. Smith, Esq. Park House, Wombwell	10 0 0
Messrs. Tins and Harrison, Barnsley	10 0 0
The Rev. B. Charlesworth, Darfield	10 0 0
The Rev. W. Wordsworth, Monk Bretton	10 0 0
Mr. and Mrs. W. S. Stanhope, Cannon Hall	10 0 0
The Messrs. Spencer Stanhope, Banks Hall	10 0 0
H. J. Morton, Esq., Leeds	10 0 0
William Shepherd, Esq., Barnsley	10 0 0
Messrs. Hattersley and Parkinson, Barnsley	10 0 0
Charles Tee, Esq., Pinder Oaks	10 0 0
Messrs. Thomas Cope and Son, Barnsley	10 0 0
Messrs. Newman and Son, Barnsley	10 0 0
Mr. Richard Pybus, Barnsley	10 0 0
Mr. Joseph Carter, Barnsley	10 0 0
Mr. Henry Harvey, Barnsley	10 0 0
Messrs. Rhodes, Haguel, and Co., Carr House Colliery	10 0 0
Messrs. H. J. and J. R. Spencer, Barnsley	10 0 0
Messrs. Haxworth and Carnley	10 0 0
E. B. Beaumont, Esq., Upperwood Hall	10 0 0
Richard Collden, Esq., M.P.	10 0 0
Dr. Paley, Bishopston Grange, Ripon	10 0 0
Ralph Creyke, Esq., Bawcliffe Hall, Selby	10 0 0
J. Kroeke, Esq., Armitage Bridge, Huddersfield	10 0 0
J. Marriott, Esq., Liverpool	10 0 0
Mr. Thomas Chapman, Staithes, Nettle	10 0 0
J. Dent, Esq., Bilton Park	10 0 0

## In the Court of Vice-Wardens of the Stannaries.—Stannaries of Cornwall.

IN THE CAUSE OF MILLETT AND ANOTHER v. ANGOVE.

NOTICE IS HEREBY GIVEN, that, pursuant to an ORDER, or DECREE, made in the above-mentioned Cause, and bearing date the 8th day of January last, a PUBLIC AUCTION will be HELD at WHEAT NELSON, in the parish of Camborne, within the said Stannaries, on Tuesday, the 17th day of March next, at Twelve o'clock at noon, for SELLING, either together or in lots, the undermentioned MINING MACHINERY, MATERIALS, and other effects; viz.—

- |                               |  |
|-------------------------------|--|
| 122-in. cylinder engine.      | 2 balance bobs.  |
| 1 boiler, 10 tons.            | 1 smith's bellows; 1 anvil; 1 vice and screw-stock; about 3 cwt. smith's tools; 1 winch. |
| 1 shears.                     | 2 pairs beams and scales; ½-cwt. brass weights.  |
| 22-horse whims.               | 150 fms. horse-whim chain.   |
| 44 fms. 11-in. plunging lift. | 60 fms. capstan chain.   |
| 12 fms. 10-in. drawing lift.  | 4 horse-whim kiddles.  |
| 16 fms. 6-in. drawing lift.   | 6 hand and wheelbarrows.   |
| 60 fms. 8-in. main rods.      |  |
- Four cwt. tallow; 12 gallons rape oil; 60 powder cans; 1 cwt. powder; 20 coils safety fuse; 70 lbs. candles; lot of old rope; about 2 cwt. steel; about 100 feet balk timber; 1 tram-wagon, and 15 fms. tramway; 180 fms. ladders; shovels and pick-hills; carpenter's bench; grinders; miners' chests; miners' tools; a quantity of new and old iron; and a variety of other materials and effects.

For viewing the same, application may be made to Mr. WILLIAM TONKIN, the officer in possession on the mine; and, for further particulars, to Messrs. RODD, DARRK, and COANISH, solicitors, Penzance; or to Messrs. HODGKIN and HODGKIN, solicitors, Truro. Dated Registrar's Office, Truro, Feb. 25, 1857.

## CURRENT GOING COLLIERY AT SCOTSWOOD, NEAR NEWCASTLE-UPON-TYNE, FOR SALE BY PUBLIC AUCTION.

MR. GEO. HARDCASTLE is instructed to SELL, BY PUBLIC AUCTION, at Tomlinson's Royal Exchange Hotel, Grey-street, Newcastle-upon-Tyne, on Tuesday, the 17th day of March, 1857, at Two for Three o'clock in the afternoon, the valuable COLLIERY and WORKING PLANT, known as the MONTAGUE COLLIERY, most advantageously situated upon the North Bank of the navigable River Tyne, at Scotswood, about three miles west of Newcastle.

The royalty of this very valuable COLLIERY comprises an area of about 400 acres, held under a 21 years' lease from Lord Roxbury, dated the 23d November, 1854. The certain rent is £300 per annum, and the "tenths" is, per chaldron, or 18s. 6d. per "ten." The strata of coal which have been sunk to are the Five Quarter, or Bell's Close Low Main Seam, at a depth of 48 fms.; and the Brockwell Seam, 61 fms. from the surface.

The WORKING PLANT includes ONE DOUBLE ACTIONED HIGH-PRESSURE 80-horse PUMPING ENGINE, three steam boilers, two sets of 20 in. malleable iron pumps, one 30-horse winding engine, one smaller steam-engine, two engine-houses, shear legs, pulley frames, two powerful gins, main, tail, and ground crabs, winches, pit cages, tramways, trams and tubs, shipping stage and gearing, storehouse, blacksmiths', joiners', and engine-wrights' shops and tools, and all other usual appurtenances of a well-appointed working colliery.

When in full operation, the Montague Colliery is capable of producing 600 tons per day of excellent coking coal, drawn from a shaft within 100 yards of the Tyne, and delivered at a quay 215 ft. in length, by six spouts for river craft, and two for land sale. Facts like these require no comment, and they can easily be verified by an inspection of the premises, which will be readily allowed on application to Mr. Wm. MONTAGUE, colliery owner, Kytton, near Newcastle-upon-Tyne.

For further particulars apply to Messrs. T. and W. CHATERS, solicitors, Newcastle-upon-Tyne; or to the auctioneer.

Sunderland Sale Office, Feb. 25, 1857.

## IMPORTANT IRON SALE AT SUNDERLAND, IN THE COUNTY OF DURHAM.—PRELIMINARY ADVERTISEMENT.

SALE BY AUCTION AT BISHOPWEARMOUTH IRONWORKS.

MR. GEO. HARDCASTLE has the honour of being commissioned by the Derwent Iron Company (prior to their disposing of the extensive and valuable property known as the Bishopwearmouth Ironworks), to SELL, BY PUBLIC AUCTION, upon the premises, about the latter end of the month of March next, a large quantity of UNMANUFACTURED SCRAP IRON and CAST METAL; Malleable Iron Shafting; New and Old Timber; Smiths' Tools, Anvils, Bellows, &c.; capital Punching Machine; large Boring Machine; Iron Ballast Trucks; Travelling Cranes; Bogies, Carts, Wagons, &c.; Boilers, Shear Legs, Old Rails, Miscellaneous Machinery, and Portions of Engines, &c.

Particulars will be given in catalogues and future advertisements.—Further information may be obtained on application at the offices of the ironworks, Bishopwearmouth, to Messrs. MOYSEY, LAMSON, and Co.; to GEORGE FORSTER, Esq., Consett Ironworks; or to the auctioneer.

Sunderland Sale Office, Feb. 25, 1857.

## SOUTH SYDENHAM, DEVON.—TO MINE AGENTS AND OTHERS.

SPARE MINING MATERIALS FOR SALE.

MR. W. MONK WILL SELL, BY AUCTION, on Monday, the 9th day of March, 1857, at WEST COLLAcombe MINE, in the parish of South Sydenham, about five miles from Tavistock, the following SPARE MINING MATERIALS, comprising—

- |                                 |                                 |
|---------------------------------|---------------------------------|
| 149 ft. 12 in. pumps.           | 159 ft. 10 in. pumps.           |
| 110 ft. 12 in. workings.        | 210 ft. 10 in. workings.        |
| 15 ft. 12 in. windrose.         | 16 ft. 10 in. windrose.         |
| 112 in. door and doorpiece.     | 111 ft. 10 in. plunger-pole.    |
| 111 ft. 12 in. plunger-pole.    | 19 ft. 10 in. plunger-pole.     |
| 116 ft. 12 in. plunger-pole.    | 110 in. door and doorpiece.     |
| 112 in. stuffing-box and gland. | 110 in. stuffing-box and gland. |
| 112 in. H-piece and door.       | 110 in. H-piece and door.       |
| 26 ft. 12 in. matchings.        | 16 ft. 8 in. windrose.          |
| 13 ft. 12 in. matching.         | 13 ft. 10 in. matching.         |
| 12 ft. 12 in. matching.         | Capstan and shears, complete.   |

110 in. capstan-rope, about 60 fms.; 52 fms. of 10 in. main rods; 5 pairs rod plates; 8 shaft rolls; 8 rod rolls; 1 iron tram wagon; about 10 tons of tramroad iron; lot of tram saddles; lot of rod pins; clacks and seatings; flange bolts and burrs; staples and glands; old cast and wrought-iron; horse-whim, 12 ft. cage, with oak axle; 50 fms. of 4 in. wire-rope; 100 fms. of 3 in. wire-rope; 1 small water-wheel; poppet heads; pulleys and stays, complete; 2 dressing sheds; lot of casing and dividing timber; with other good and useful materials.

The auctioneer begs to acquaint mine agents and others that the materials are in good condition, and easy of transit; there are good roads leading to Tavistock, Launceston, and the quays on the River Tamar. Refreshments at Twelve o'clock, and the sale to commence at One, and the whole will be disposed of without reserve. The materials may be viewed, and further information obtained of Capt. RONDA, on mine; and of the auctioneer, Abbey, Tavistock. Dated March 2, 1857.

## VERY EXTENSIVE SALE OF ENGINES AND MINING MATERIALS.

MR. BROWNE and MR. CLYMA have been favoured with instructions to SUBMIT TO SALE, BY PUBLIC AUCTION, on Monday, the 30th day of March inst., and following day, at Eleven o'clock in the forenoon of each day, at GREAT POLGOOTH MINE, near St. Austell, Cornwall, the WHOLE of the extensive and valuable MINING MACHINERY, MATERIALS, and OTHER EFFECTS thereon—viz., One 80 in. cylinder PUMPING ENGINE, 10 ft. in cylinder, 8 1/2 ft. in shaft, with 4 boilers 48 tons, and 2 first pieces of rods and caps; 1 67 in. cylinder pumping engine, 10 ft. in cylinder, 8 ft. in shaft, with 2 boilers 24 tons, and first piece of rod and caps; 1 35 in. cylinder engine, used for stamping, 10 ft. stroke, with 4 boilers 48 tons, and 2 first pieces of rods and caps; 1 24 in. cylinder engine, used for stamping, 10 ft. stroke, with 2 boilers 10 tons, iron stamps, axles for 45 heads, frames, &c.; 1 22 in. cylinder winding engine, with 7 tons boiler, iron cage, &c., attached to this engine is a crusher, complete; 2 22 in. cylinder winding engines, each with 7 tons boiler, iron cage, &c.

An iron balance-bob, complete.

4 large balance-bobs, and 1 angular do.

38-armed capstans, oak axle, and iron sockets.

1 small armed capstan, oak axle, and iron sockets.

3 19 in. plunger-lifts, with 20 in. pumps, 93 fms., complete.

1 17 in. drawing-lift, with 18 in. pumps, 22 fms., complete.

2 15 in. drawing-lifts, with 16 in. pumps, 27 fms., complete.

1 11 in. plunger-lift, with 16 in. pumps, 46 fms., complete.

1 10 in. plunger-lift, with 10 in. pumps, 45 fms., complete.

2 14 in. plunger-lifts, with 14 in. pumps, 80 fms., complete.

2 10 in. drawing-lifts, with 11 in. pumps, 41 fms., complete.

2 11 in. drawing-lifts, with 12 in. pumps, 23 fms., complete.

1 7 in. drawing-lift, with 9 in. pumps, 12 fms., complete.

1 7 in. plunger-lift, with 9 in. pumps, 33 fms., complete.

1 6 in. drawing-lift, with 7 in. pumps, 6 fms., complete.

2 9 ft. 14 in. pumps, and 4 9 ft. 8 in. pumps.

Boils, burrs, rings, braces, clacks, buckets and rods, to match the above.

4 tons best iron rods, 2 1/2 in. 1 1/2 in.

Best iron rod pins, staples and glands.

30 tons light railroad iron.

35 tons tramroad iron, with saddles.

20 tons tramroad iron, with saddles.

20 tons tramroad iron, with saddles.

20 tons tramroad iron, with saddles.

20 tons tramroad iron, with saddles.

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20 tons tramroad iron, with saddles.

20 tons tramroad iron, with saddles.

## YEOLAND CONSOLS TIN MINE, NEAR PLYMOUTH.

MR. HENRY WILLS is instructed to OFFER FOR SALE, BY PUBLIC AUCTION, in One Lot, at the Globe Hotel, Plymouth, on Monday, the 2nd of March next, at One o'clock precisely, the valuable MINE MACHINERY, MATERIALS, OILS, STORES, &c., forming the whole of the property of the shareholders in and on the Mine; comprising—

- |  |  |
|--|--|
| 1 56 in. rotary double-action STEAM-ENGINE, with 11 tons fly-wheel, wrought-iron shafts and sweep-rod, and two boilers, 10 and 9 tons each; 2 cast-iron STAMPS AXLES, to carry 12 heads each, and 24 heads of stamps, with frames, &c.; 1 22 in. double action DRAWING ENGINE complete, with 10 tons boiler. | 1 6 in. drawing lift, 12 fms. long.                              |
| 44 fms. of 3 1/2 round iron rods, with joints and pins, complete.  | 1 7 in. drawing lift, 18 fms. long.                              |
| 23 fms. 2 in. ditto, ditto.  | 1 4 in. drawing lift, 10 fms. long.                              |
| 50 fms. 1 1/2 in. ditto, ditto.  | 100 fms. of 8 and 9 inch wood shaft, with plates, &c., complete. |
| 2 shaft bobs complete.   | 300 fms. tram iron, 2 1/2 by 3/4, with saddles.                  |
| 2 logging bobs complete.   | 7 iron tram-wagons, and 1 wooden ditto.                          |
| 2 arm capstans.  | New and useful iron, about 7 tons.                               |
| 140 fms. of 9 in. capstan rope.  | Old iron, 5 tons.  |
| 300 fms. of contractors' metals.   | Shed, 200 ft. by 7 ft.   |
| 1 shears, 42 ft., with shives, complete.   | Winding machine, to weigh 1 ton.                                 |
| 300 fms. of 3 and 1/2 best chain.  | 10 tin-dressing leaves.  |
| 300 fms. old chain.  | 3 round bobbles.   |
| 14 fms. flat rope pulleys and stands.  | 8 other bobbles.   |
| 12 pulleys and stands for 3 1/2 in. rods.  | 8 tin-dressing racks, with shed over.                            |
| 12 pulleys and stands for 3 in. rods.  | Small water-wheel.   |
| 4 horse-whim pulleys, and 1 large capstan shive.   | Wheel and hand barrows, and other dressing tools.                |
| 8 3 in. plunger-lifts, respectively 18 fms., 35 fms., and 30 fms.  | 3 large tin chests.  |
| 1 8 in. drawing lift, 12 fms. long.  | Leather, oil, nails, bits, &c.                                   |

The mine is held under a lease of 14 years from Christmas, 1854. The set is extensive, and the royalty 1-20th until a dividend is paid, and then 1-15th.



**TO ENGINEERS, MINERS, SHIP-BUILDERS, CONTRACTORS, AND OTHERS.**—Mr. WHEATLEY KIRK begs to call attention to his large and valuable STOCK OF ENGINES, TOOLS, &c., including HORIZONTAL HIGH-PRESSURE ENGINE, 20 in. cylinder, 4 ft. stroke; ditto, 15 in. cylinder, 3 ft. 6 in. stroke; ditto, 16 in. cylinder, 3 ft. stroke; ditto, 12 in. cylinder, 3 ft. stroke; ditto, 10 in. cylinder, 3 ft. stroke; ditto, 7 in. cylinder, 3 ft. stroke; ditto, 5 in. cylinder, 3 ft. stroke; ditto, 4 in. cylinder, 3 ft. stroke; ditto, 3 in. cylinder, 3 ft. stroke; ditto, 2 in. cylinder, 3 ft. stroke; ditto, 1 in. cylinder, 3 ft. stroke; ditto, 1/2 in. cylinder, 3 ft. stroke; ditto, 1/4 in. cylinder, 3 ft. stroke; ditto, 1/8 in. cylinder, 3 ft. stroke; ditto, 1/16 in. cylinder, 3 ft. stroke; ditto, 1/32 in. cylinder, 3 ft. stroke; ditto, 1/64 in. cylinder, 3 ft. stroke; ditto, 1/128 in. cylinder, 3 ft. stroke; ditto, 1/256 in. cylinder, 3 ft. stroke; ditto, 1/512 in. cylinder, 3 ft. stroke; ditto, 1/1024 in. cylinder, 3 ft. stroke; ditto, 1/2048 in. cylinder, 3 ft. stroke; ditto, 1/4096 in. cylinder, 3 ft. stroke; ditto, 1/8192 in. cylinder, 3 ft. stroke; ditto, 1/16384 in. cylinder, 3 ft. stroke; ditto, 1/32768 in. cylinder, 3 ft. stroke; ditto, 1/65536 in. cylinder, 3 ft. stroke; ditto, 1/131072 in. cylinder, 3 ft. stroke; ditto, 1/262144 in. cylinder, 3 ft. stroke; ditto, 1/524288 in. cylinder, 3 ft. stroke; ditto, 1/1048576 in. cylinder, 3 ft. stroke; ditto, 1/2097152 in. cylinder, 3 ft. stroke; ditto, 1/4194304 in. cylinder, 3 ft. stroke; ditto, 1/8388608 in. cylinder, 3 ft. stroke; ditto, 1/16777216 in. cylinder, 3 ft. stroke; ditto, 1/33554432 in. cylinder, 3 ft. stroke; ditto, 1/67108864 in. cylinder, 3 ft. stroke; ditto, 1/134217728 in. cylinder, 3 ft. stroke; ditto, 1/268435456 in. cylinder, 3 ft. stroke; ditto, 1/536870912 in. cylinder, 3 ft. stroke; ditto, 1/1073741824 in. cylinder, 3 ft. stroke; ditto, 1/2147483648 in. cylinder, 3 ft. stroke; ditto, 1/4294967296 in. cylinder, 3 ft. stroke; ditto, 1/8589934592 in. cylinder, 3 ft. stroke; ditto, 1/17179869184 in. cylinder, 3 ft. stroke; ditto, 1/34359738368 in. cylinder, 3 ft. stroke; ditto, 1/68719476736 in. cylinder, 3 ft. stroke; ditto, 1/137438953472 in. cylinder, 3 ft. stroke; ditto, 1/274877906944 in. cylinder, 3 ft. stroke; ditto, 1/549755813888 in. cylinder, 3 ft. stroke; ditto, 1/1099511627776 in. cylinder, 3 ft. stroke; ditto, 1/2199023255552 in. cylinder, 3 ft. stroke; ditto, 1/4398046511104 in. cylinder, 3 ft. stroke; ditto, 1/8796093022208 in. cylinder, 3 ft. stroke; ditto, 1/17592186044416 in. cylinder, 3 ft. stroke; ditto, 1/35184372088832 in. cylinder, 3 ft. stroke; ditto, 1/70368744177664 in. cylinder, 3 ft. stroke; ditto, 1/140737488355328 in. cylinder, 3 ft. stroke; ditto, 1/281474976710656 in. cylinder, 3 ft. stroke; ditto, 1/562949953421312 in. cylinder, 3 ft. stroke; ditto, 1/1125899906842624 in. cylinder, 3 ft. stroke; ditto, 1/2251799813685248 in. cylinder, 3 ft. stroke; ditto, 1/4503599627370496 in. cylinder, 3 ft. stroke; ditto, 1/9007199254740992 in. cylinder, 3 ft. stroke; ditto, 1/18014398509481984 in. cylinder, 3 ft. stroke; ditto, 1/36028797018963968 in. cylinder, 3 ft. stroke; ditto, 1/72057594037927936 in. cylinder, 3 ft. stroke; ditto, 1/144115188075855872 in. cylinder, 3 ft. stroke; ditto, 1/288230376151711744 in. cylinder, 3 ft. stroke; ditto, 1/576460752303423488 in. cylinder, 3 ft. stroke; ditto, 1/1152921504606846976 in. cylinder, 3 ft. stroke; ditto, 1/2305843009213693952 in. cylinder, 3 ft. stroke; ditto, 1/4611686018427387904 in. cylinder, 3 ft. stroke; ditto, 1/9223372036854775808 in. cylinder, 3 ft. stroke; ditto, 1/18446744073709551616 in. cylinder, 3 ft. stroke; ditto, 1/36893488147419103232 in. cylinder, 3 ft. stroke; ditto, 1/73786976294838206464 in. cylinder, 3 ft. stroke; ditto, 1/147573952589676412928 in. cylinder, 3 ft. stroke; ditto, 1/295147905179352825856 in. cylinder, 3 ft. stroke; ditto, 1/590295810358705651712 in. cylinder, 3 ft. stroke; ditto, 1/1180591620717411303424 in. cylinder, 3 ft. stroke; ditto, 1/2361183241434822606848 in. cylinder, 3 ft. stroke; ditto, 1/4722366482869645213696 in. cylinder, 3 ft. stroke; ditto, 1/9444732965739290427392 in. cylinder, 3 ft. stroke; ditto, 1/18889465931478580854784 in. cylinder, 3 ft. stroke; ditto, 1/37778931862957161709568 in. cylinder, 3 ft. stroke; ditto, 1/75557863725914323419136 in. cylinder, 3 ft. stroke; ditto, 1/151115727451828646838272 in. cylinder, 3 ft. stroke; ditto, 1/302231454903657293676544 in. cylinder, 3 ft. stroke; ditto, 1/604462909807314587353088 in. cylinder, 3 ft. stroke; ditto, 1/1208925819614629174706176 in. cylinder, 3 ft. stroke; ditto, 1/2417851639229258349412352 in. cylinder, 3 ft. stroke; ditto, 1/4835703278458516698824704 in. cylinder, 3 ft. stroke; ditto, 1/9671406556917033397649408 in. cylinder, 3 ft. stroke; ditto, 1/19342813113834066795298816 in. cylinder, 3 ft. stroke; ditto, 1/38685626227668133590597632 in. cylinder, 3 ft. stroke; ditto, 1/77371252455336267181195264 in. cylinder, 3 ft. stroke; ditto, 1/154742504910672534362390528 in. cylinder, 3 ft. stroke; ditto, 1/309485009821345068724781056 in. cylinder, 3 ft. stroke; 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ditto, 1/44601490397061246283071436545296702531960832 in. cylinder, 3 ft. stroke; ditto, 1/89202980794122492566142873090593405063921664 in. cylinder, 3 ft. stroke; ditto, 1/178405961588244985132285746181186810127843328 in. cylinder, 3 ft. stroke; ditto, 1/356811923176489970264571492362373620255686656 in. cylinder, 3 ft. stroke; ditto, 1/713623846352979940529142984724747240511373312 in. cylinder, 3 ft. stroke; ditto, 1/1427247692705959881058285969449494481022746624 in. cylinder, 3 ft. stroke; ditto, 1/2854495385411919762116571938898988962045493248 in. cylinder, 3 ft. stroke; ditto, 1/5708990770823839524233143877797977924090986496 in. cylinder, 3 ft. stroke; ditto, 1/11417981541647679048466287755595955848181972992 in. cylinder, 3 ft. stroke; ditto, 1/22835963083295358096932575511191911696363945984 in. cylinder, 3 ft. stroke; ditto, 1/45671926166590716193865151022383823392727891968 in. cylinder, 3 ft. stroke; ditto, 1/91343852333181432387730302044767646785455783936 in. cylinder, 3 ft. stroke; 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ditto, 1/3064991081731777716716693983004616959862594563087204352 in. cylinder, 3 ft. stroke; ditto, 1/6129982163463555433433387966009233919725189126174408704 in. cylinder, 3 ft. stroke; ditto, 1/12259964326927110866866775932018467839450378252348817728 in. cylinder, 3 ft. stroke; ditto, 1/2451992865385422173373355186403693567890075650469763552 in. cylinder, 3 ft. stroke; ditto, 1/4903985730770844346746710372807387135780151300939527104 in. cylinder, 3 ft. stroke; ditto, 1/9807971461541688693493420745614774271560302601879054208 in. cylinder, 3 ft. stroke; ditto, 1/19615942922883377386986841491229548543120605203758108416 in. cylinder, 3 ft. stroke; ditto, 1/39231885845766754773973682982459097086241210407516216832 in. cylinder, 3 ft. stroke; ditto, 1/78463771691533509547947365964918194172482420815032433664 in. cylinder, 3 ft. stroke; ditto, 1/156927543383067019095894731929836388344964841630064867328 in. cylinder, 3 ft. stroke; ditto, 1/313855086766134038191789463859672776689929683260129734656 in. cylinder, 3 ft. stroke; 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ditto, 1/138034926934429500865141834034655245481715935284139936877137937956864 in. cylinder, 3 ft. stroke; ditto, 1/276069853868859001730283668069



